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# FACT BOOK OF U.S. AGRICULTURE

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## To The Reader

This Fact Book was designed as a reference for anyone who writes or talks about agriculture -- the Nation's largest single industry. The U. S. Department of Agriculture has many statistical and specialized publications, but this is USDA's first major attempt to summarize today's agricultural complex within one cover.

To those of you experienced in reporting farm news, perhaps this book will provide additional background. To those of you who left the farm long ago or who are city reared, we hope this book will explain how modern agriculture touches the lives of all Americans every day.

This publication is intended to give the casual reader a quick grasp of a particular subject without the burden of detail. For those who want more details, the 1962 Agricultural Statistics\* will be especially useful, as it will contain many historical tables as well as current information. It will be published about March 1963.

We welcome comments. Please write to: Special Reports Division, Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

\*See Appendix IV, Additional Reading Material and Bibliography



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**FACT BOOK**

**OF**  
**U. S.**  
**AGRICULTURE**

**Revised**  
**March 1963**

<sup>2a</sup>  
**Office of Information**  
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## CHAPTER I

# AGRICULTURE AND CHANGING TIMES

## *Agriculture Is All of Us*

Farm and city have never been closer. In this age of specialization, each depends on the other.

The farmer depends on the city and town worker to supply electricity, gasoline, hardware, tractors, milking machines, fertilizer, feed, credit, and bathtubs, kitchen stoves, newspapers and even most processed food.

The city worker expects the farmer to continue supplying a never-ending stream of food, fiber, wood, and other products.

For 6.8 million American workers, on 3.6 million farms, agriculture is a way of life, a job, a business, a chore or pleasure.

For 6 million workers, agriculture is a customer. These workers supply the farmer with tools and materials for farm production; they supply his family's daily needs. Farmers bought \$43 billion worth of goods and services in 1962; \$28 billion for production supplies and \$15 billion for family living.

For 10 million workers, agriculture is a supplier of raw materials, the workers who transport, process, manufacture, and sell farm goods. The food industry alone has about 5.3 million employees and a payroll of \$22.8 billion. Farmers sold nearly \$36 billion worth of farm products in 1962 and earned over \$7 billion off the farm.

For 188 million Americans, agriculture is three square meals a day, most of the clothing we wear, the wood in our homes.

For 3 billion people on earth, American agriculture is a magnificent example of abundant production, one proof of our successful democratic system. But, while world farm production continues to rise, population is also increasing and per capita food output is still inadequate in many countries.

### THE FARMER WEARS MANY HATS

The farmer is a buyer, a seller, a taxpayer, a consumer, a manufacturer, a businessman, and a worker. He is never any of these alone. Here is a portrait of a "statistical" farmer in 1962:

As a buyer, he spent \$7,500 for his business needs. As a seller, he received \$10,000 for his farm products. As a taxpayer, he contributed \$1,000 to Government. As a consumer, he spent \$4,000 on family living. He earned more than \$1,500 off the farm. His house and personal goods were valued at about \$6,500. As a manufacturer, his "factory" was valued at more than \$47,600. As a producer, he farmed 325 acres, earned about 5 percent on his capital, had about \$3,600 in liquid assets, and owed \$7,000\* to creditors. As a worker, he labored almost 50 hours a week. The farmhouse "rent" and home-produced food and fuel he used were valued at almost \$1,000. His net farm income was \$3,500.

Per capita income of farm population was about \$1,400 (\$900 from the farm and \$500 from off-the-farm). This includes government payments of about \$100. Non-farmer per capita income averaged \$2,400.

In 1940 the "statistical" farmer spent \$1,000 for business expenses and received less than \$1,500 for his farm goods. His "factory" was valued at less than \$6,200, his total debt was less than \$1,600 and he spent \$1,000 for family living. The farmhouse "rent" and home-produced food and fuel were valued at \$300. Farmer's per capita income was \$250, compared with \$700 for the non-farmer.

### FARMERS ARE PEOPLE

Statisticians may measure them, economists may gauge their prospects, and books may be written about them, but farmers are just people. The "statistical" farmer doesn't really exist, national averages do not tell the whole story. Farmers are as different from each other as they are from city people.

There are as many opinions about what a farmer is, what he should be, as there are farmers.

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\* Some farm assets are not owned by farmers; e.g., many farmers rent land and use custom equipment.



Farmers have long been lumped together. Many writers still recall their youth when farming meant a few cows, a few chickens, a pig or two, a garden, and a small cash crop. Although hundreds of thousands of these farms still exist, they contribute little to total agricultural production. On the other hand, only a relative handful of farms are the factory type. Most farms lie somewhere in between these two extremes.

#### FARMERS ARE EFFICIENT

One hour of farm labor produces more than four times as much food and other crops as it did in 1919-21. Crop production is 70 percent higher per acre. Output per breeding animal is 90 percent greater.

One farm worker supplies food, fiber and other products for 27 people; in 1920 he supplied 8.

Output per man-hour of the American farm worker in the 1950's increased 5.1 percent a year, while output per man-hour in nonfarm industry increased by 2.2 percent a year.

#### FARMING IS THE NATION'S BIGGEST INDUSTRY

Agriculture's 6.8 million workers exceed the combined employment in transportation, public utilities, the steel and automobile industries.

The assets of agriculture are \$214 billion, equal to nearly two-thirds of the market value of all corporation stocks on the New York Stock Exchange. The investment in agriculture's production assets represents \$24,000 for each farm worker.

Farmers have invested about \$18 billion in cars, trucks, tractors, and other farm machinery. Production expenses have quadrupled in 40 years; less than \$7 billion in 1922, \$28 billion 1962. Gross farm income has more than tripled -- \$11 billion in 1922, \$40 billion in 1962, plus \$7 billion earned off the farm.

These national totals and averages are significant to industrial producers. It is important to realize that, while the number of farms and farm workers has steadily decreased, farmers' total expenditures continue to increase.

## FARMERS ARE GOOD CUSTOMERS

In 1961, farmers used enough steel products to make almost 5 million compact cars, enough rubber to put tires on more than 6 million cars, enough electricity to power the six New England States. They used the equivalent of 15 billion gallons of crude oil, more than any other single industry uses and they spent \$1.5 billion for fertilizer and lime.

## FARMERS WORK FOR PEACE

The 1962 world food deficit is equal to 1.5 million metric tons of nonfat dry milk, plus 150,000 tons of dry peas and beans, plus 3 million tons of vegetable oil, plus 29 millions tons of wheat. American farmers (and all of us, as taxpayers) are helping to fill this deficit. One out of every five acres harvested is for export. Our 1962 agricultural exports totaled about \$5.1 billion, almost a quarter of total U.S. exports. The Food for Peace program constitutes 32 percent of farm exports, \$1.6 billion worth. Our farmers are helping to raise the nutritional level of people in the food deficit countries.

## *The Way of Farm Life*

A farmer has been defined as: One who makes his entire living from farming; or, one who makes some of his living from farming; or, one who lives on a farm; or, one who owns a farm.

Farming has many images. The owner of a 320-acre grain-livestock place -- with \$100,000 invested in equipment, buildings, and livestock, living in a modern air-conditioned home, and employing accounting and biology to make ends meet -- is a farmer. So is the sharecropper, farming 40 acres.

Also counted as farmers are the orange grove owner in Florida, the dairyman in Minnesota, the apple grower in New York, the egg producer in California, the wheat farmer in the Dakotas, the cattleman in Texas, and the 5.5 million others throughout the country who produce our food and fiber.

Farming is a way of life, a business, a career, a job, a heritage, and a future to 14.3 million people living on 3.7 million farms. Of these 3.7 million farms, 1.5 million produce 87 percent of our total farm output, the other 2.2 million produce only 13 percent.\*

The Census Bureau defines a farm as a place of 10 or more acres, if the value of the farm products sold is \$50 or more -- and a place of less than 10 acres, if the value of farm products sold is \$250 or more. (See, *The Changing Family Farm*, page 28.)

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\*See Jobs and Workers, page 52



## SOME SIGNIFICANT CHANGES

### Population changes

From 1950 to 1960, the Nation's urban population gained by 29.3 percent while the rural population declined by 0.8 percent. Urban people numbered 125 million in 1960, rural people numbered 54 million. Some 16 million lived in suburban areas or in small towns that were primarily rural in 1950 but classified as urban in 1960.

The rural-farm population numbered 13.5 million in the 1960 census, 7.5 percent of total population. The count in 1950 was 23 million. About forty percent of the change, however, was due to the change in definition by the Census Bureau. The South and the Northeast showed the greatest rate of farm population loss. A decline in population in small towns (under 2,000) has also been evident since 1950.

Of the 3,134 counties in the United States, only 12 percent (361) are in metropolitan areas, yet 84 percent of the Nation's total population growth in the 1950's occurred within them. Almost half of all counties actually declined in population. These losses of population, produced by people moving away, distort the age structure of a county. Over a period of time, the county becomes heavily weighted with middle-aged or elderly people. The young people are the ones who move and, because they are the potential parents, the number of young children declines.

### Fewer farms - larger farms

From 1954 to 1959, total farm acreage declined only 3 percent (to 1.1 billion acres), but the number of farms dropped about 25 percent (to 3.7 million). Average farm size has grown from 134 acres in 1880 to 325 in 1963.

The 3.7 million farms in 1959 was the smallest number reported for the 48 States since 1870. There were about 1 million fewer farms in 1959 than in 1954. Some of the decrease was due to a change in definition of a farm by the Census Bureau. Most of the decrease from 1954 occurred in farms of less than 50 acres. Farms of over 500 acres comprised 9 percent of all farms in 48 States.

As farm mechanization grows, farm operators are able to handle more land. More farms are being combined to make use of modern power and equipment. A larger farm also provides more full-time employment, on the farm, to farmers and their children.

### Farms produce more

In 1959, 800,000 farms sold at least \$10,000 worth of farm products; 36 percent more farms than in 1954. About 1.6 million sold less than \$2,500 worth of goods, a third fewer farms than in 1954. In 5 years, actual physical production per acre rose a sixth. Farm output per man-hour increased almost two-fifths.

### Farms more specialized now

Farms are generally becoming larger and more specialized, but most of them are still family units.

From 1954 to 1959, the number of farms reporting milk cows dropped almost 40 percent; the average number of cows kept on a farm increased 30 percent.

Number of farms reporting egg sales dropped almost 40 percent, average number of eggs sold per farm increased almost 100 percent.

Number of farms reporting cotton harvested dropped 40 percent, cotton acreage per farm increased almost 35 percent.

### Farming a high capital industry

Almost overnight, agriculture has become one of the higher capital-using industries. Between 1940 and 1962 capital requirements on the average farm increased sevenfold, from \$6,000 to \$47,600. Production expenses were nearly 70 percent of gross income in 1962. Bigger farms and more equipment are two reasons for a 50 percent increase in farm efficiency.\*

The 1962 average value of assets used per worker in agriculture was \$24,000.

Total assets in agriculture climbed to \$214 billion early in 1963, up from \$53 billion in 1940. This is equal to more than two-thirds of the market value of all corporation stocks on the New York Stock Exchange.

Production assets used for 1962 farm output were worth \$163 billion, up from \$94 billion in 1950 and \$38 billion in 1940. Average per farm value of assets used in farm production has increased a third since 1958.

### Higher value per farm and per acre

The average value of just land and buildings per farm in 1959 was more than \$34,800, a 71 percent increase over 1954. The 1959 value was  $2\frac{1}{2}$  times the 1950 average and 6 times the 1940 average.

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\* Production about doubled and there were fewer workers, but each worker used more inputs (tractors, fertilizer, etc.).



The average value per acre of farm land and buildings in November 1962 was \$126, a 48 percent increase over 1955.

#### More farmers own their farms

A larger proportion of farm operators owned their farms in whole or in part in 1959 than ever before; nearly 80 percent, compared with less than 60 percent in 1935. And more farmers, twice as many as in 1935, have been renting additional land to enlarge their farms.

#### More older farmers now

The average age of farmers continues to rise from about 48 in 1949 to 50 in 1959. In 1959, 16.7 percent of all farm operators were 65 and older, the highest ever recorded by a Census of Agriculture. Two-thirds of these 65-and-older operators were on farms with sales of farm products less than \$2,500.

#### THE FARMER'S LEVEL OF LIVING

##### Great variation

A new formula for determining farmers' level-of-living index in 1959 is based on average value of sales per farm, average value of land and buildings per farm, percentage of farms with telephones, percentage of farms with home freezers, and percentage of farms with automobiles. The index is a measure of these weighted combined factors.

The 10 high ranking counties were in the West. In the top county (having an index of 243) average value of land and buildings per farm was \$205,000; average gross sales were over \$130,000. More than 80 percent had telephones, 53 percent had home freezers, and almost 80 percent had automobiles. The county had almost 40 percent fewer farms than in 1950, while average size of farm had jumped more than 35 percent. Estimated net income per farm was more than \$40,000.

The 10 low ranking counties were in the South. In the lowest ranking county (index of 12) average value of land and buildings was \$3,000; average value of gross sales per farm was \$200. Ten percent had telephones, 10 percent had home freezers, and 12 percent had automobiles. There were almost 65 percent fewer farms than in 1950, but average farm size had remained about the same. Net income per farm was less than \$100.

Old age, poor health, and limited schooling are particularly characteristic of the smaller and marginal farms. (See also section on Technology, page 28 .)

## WHAT FARM FAMILIES SPEND

### Variation in farm family spending

Farmers in the Pacific States\* spent 73 percent more food than those in the East South Central States\*, 2 1/4 times as much for housing, 40 percent more for clothing, more than twice as much for transportation, almost twice as much for medical care, 130 percent more for reading and education.

Total family living expenditures for farmers in the Northern States\* were more than \$3,500; in the Southern States\*, \$2,800; in the Western States\* almost \$4,800. However, variations within regions are often as great as those between regions.

Farmers in the 25-34 age bracket spent nearly \$3,400 for family consumption; those between 35 and 54, \$3,700; 55-64, nearly \$2,800, and; over 65, \$2,100.

### Farm families spend more cash now\*\*

Experience based on conditions 20 years ago is apt to be misleading. A survey revealed that farm families spent \$3,300 for family living in 1955.

In 1941 they spent \$817 (with some modification in housing, insurance, gifts and contributions).

In 1955, average farm family size was 3.8 persons, ranging from 3.5 in the Pacific States to 4.3 in the South Atlantic States. The average family spent \$832 for food, including \$117 for food away from home. Housing cost \$868 -- \$351 for shelter, \$215 for furnishings and equipment, and \$302 for household operation. Clothing cost \$427 -- \$142 for women and older girls, \$43 for young girls, \$144 for men and older boys, \$42 for young boys, \$7 for children under 2, and \$49 for clothing materials and services.

Family share of transportation costs were \$378 -- \$167 for buying cars and trucks, \$194 for upkeep and running expense, and \$17 for other transportation and travel.

The family spent \$240 for medical care -- \$42 for prepaid care or insurance premiums, \$154 for medical services and, \$44 for drugs and supplies.

Almost \$70 was spent for personal services and materials -- almost \$50 for tobacco, almost \$16 for alcoholic beverages, \$123 for recreation, \$44 for reading and education, \$86 for personal insurance and, \$110 for cash gifts and contributions.

\* See Regions in Glossary, Appendix II

\*\* A 1961 study will be published about August 1963. U.S.D.A. surveyed farm families and the Bureau of Labor Statistics (Department of Labor) surveyed rural nonfarm and urban families.



## TELEPHONES AND NEWSPAPERS

In March 1960, a study showed that 80 percent of U.S. urban families had telephones, compared with 67 percent of rural families.

A May 1959 study showed that almost 64 percent of U.S. city families had daily newspaper delivery, compared with less than 50 percent of the farm families. In the Northeastern States\* the reverse was true; 52 percent of the city families had delivery, compared to more than 61 percent of the farm families. In the North Central States\*, the comparison was 71 percent for city families, 65 percent for farm; in the South\* 67 and 35; in the West\*, 68 and 50.

## THE FARMER'S HEALTH

According to surveys by the Department of Health, Education, and Welfare, farm and city people differ significantly in their health. In comparing the two groups, however, one should keep in mind that a smaller proportion of people in their prime working years (25 to 44) live on farms than in rural nonfarm or urban areas.

Farm people have more heart ailments than city people. They tend to be more limited by chronic health conditions. They tend to have more "restricted-activity days" than town and city folk, but about the same amount of "bed-disability days." Farm dwellers visit doctors and dentists less often, use hospitals less often, possibly because doctors, dentists and hospitals are less easy to visit in rural areas.

### Less health insurance

In urban areas, 72 percent of the population has hospital insurance; in rural nonfarm areas, 68 percent; in rural farm areas, 45 percent. For surgical insurance, the percentages are 66, 64, and 40 respectively; for doctor's visits, 20, 21 and 12. Rural farm coverage is considerably below both city and nonfarm rural areas, for every type of health insurance.

### More rural clinics

Another trend in rural areas is the growth of group practice clinics. In 1946 there were only 368 group practice clinics in the entire country. In 1959, there were almost 500 in rural and semi-rural areas alone, nearly half of the country's total of 1,100. Most of the plans were not prepaid.

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\*See Glossary, Regions

## EDUCATION

### Less formal schooling

Although rural areas have built new schools and otherwise improved education facilities, the rural-urban education gap, as measured by average level of education, has widened. The lower level for farm areas reflects the loss of young people. The average level of education of city people is 11.1 years, rural nonfarm people, 9.5 years, and farm people 8.8 years (1960).

A study of the educational status and college plans of young people, conducted as part of the October 1959 Current Population Survey, revealed that farm residents accounted for 6 percent of 3.3 million persons under 35 years of age enrolled in college. Of the 47,000 students enrolled in agricultural courses, 22,000 were farm youth. In high school senior classes, 32 percent of the farm youth had plans to attend college, compared with 50 percent of city students and 47 percent of the rural nonfarm students.

### Education and level of living

In 1956 about 75 percent of farmers with more than high school education had telephones, compared with 40 percent of farmers with less than 9 grades of education; 90 percent had running water, compared with 52 percent. Generally, the group with education beyond high school has about a 50 percent higher level-of-living index than the group with less than 9 years of schooling.

About 6 out of 10 persons who were hired to work on U. S. farms in 1960 had completed no more than 8 grades of school, and only about 1 in 7 had completed high school.

Male household heads who had completed at least 1 year of high school earned almost twice as much per day at farm work as those who had completed fewer than 5 years of grammar school. The better educated workers also had steadier employment, earned higher annual wages, and more often worked at nonfarm jobs than did the workers with little education.

In the South, hired farm workers had completed an average of 7 years of school compared with an average of almost 9 years completed by workers outside the South.

Average educational level of farm laborers has not improved over the past 20 years. (See Hired Farm Workers, page 54.)



## CHAPTER II

# LAND AND WATER

## *Our Use of Agricultural Land*

In our 50 States there are nearly 2.3 billion acres of land. About 80 percent of this land is agricultural including forests. A fifth is cropland, somewhat over a fourth is grassland pasture and range, and a third is in forest. The addition of Alaska and Hawaii has enlarged the land area of the United States by about a fifth, with the largest increases in forest and wasteland.

Substantial shifts in use have been made in some regions. Cropland has been concentrated on more fertile and level land. Hilly and eroded land has been put into grass and trees. This shift of crops to better soils has increased average yields.

In some areas, farm acreage is fast being absorbed by city and factory. Lands in fringe areas have been abandoned or lie partly used. From 1950 to 1960, about a million farm acres a year were needed for growing cities, highways, airports, and other intensive uses.

More than 60 percent of the land area in the 50 States is privately owned. Most of the country's crop, range, timber, and pasture production is on this private land. Federally owned land makes up a third of our land area. It is used for timber, grazing, mineral development, recreation, watershed development, and wildlife. These are our reserves for timber, minerals, and water. About 5 percent of our land area is owned by State and local governments.

In 1959, there were 633 million acres of pasture and range, 458 million acres of cropland, 773 million forest acres, 157 million of special use (cities and towns, highways, railroads, parks and farmsteads), 277 million acres of waste (barren, desert, rock, swamp).

## LAND OWNERSHIP

Only a century ago, most Americans lived on and from the land. It was settled where available and when needed. At first, differences in fertility -- even between mountains and valleys -- were almost ignored. The new and apparently boundless land offered unlimited opportunities to start a home and provide for a family.

Food was produced mainly for the farm family and domestic animals. Staple foods were stored through the winters. A single crop failure could bring incredible hardship. The winter season provided for time needed to convert fibers into clothing and timber into lumber for buildings and furniture.

A small part of farm output was used for townspeople and foreign markets. As tools became available to expand a farm with draft animals, production increased but was closely related to acreage and fertility. If and when the land "wore out" men moved on, broke new land, and began anew. The need and means to maintain fertility, timber growth, grasslands, and sparkling streams were little known, for these resources seemed limitless.

From the Ordinance of 1785 through the Homestead Act of 1862 and the series of Timber, Desert Lands, and other Acts that followed, the national objective was to get land into the hands of people who would farm it themselves. The ideal of individual working ownership grew as a distinctive feature of our people. In recent years, such ownership has continued to be encouraged through programs of supervised credit for tenant farmers and other low income farmers.

### Public interest

The public has maintained a continuous interest in natural resources through tax powers, reclamation, and the right of public domain. But a national responsibility for these natural resources and their careful use developed slowly. The Nation awoke only after millions of acres were ruined - some through needless exploitation, some through greed, some through ignorance, and some through necessity. A farm depression, subsequent national depression, and vivid proof of damaged lands brought the awakening.

Studies of farmland damage showed that tenant and sharecropper operation often contributed to erosion and to blighted farms, communities, and entire regions.



### A return to individual ownership

The pendulum began to swing toward land reclamation and land maintenance in the 1930's, when widespread rural poverty could no longer be ignored - only after clouds of dust swept into cities, with proof of wasting conditions of our lands, forests, ranges, and streams. New laws provided funds, technical aid, and improved policies to encourage farmland conservation and provide credit to meet farm needs and finance farm ownership.

The drive to rebuild and conserve natural resources and to promote farm ownership brought dividends.

From the 57.7 percent low of 1930, the proportion of farm operators owning all or part of their land had increased to 80 percent by 1959. As new machines and methods increased man's efficiency, acreage per farm increased from 156 to 325 in 1962, and total number of farms dropped from 6.3 million to 3.7 million.

### LAND LESS IMPORTANT IN PRODUCTION

No longer is acreage the major production tool. Capital and labor, use of technology, soil conditions, water, and weather bring extreme variations in land productivity.

With increased knowledge and interest, we can regard four basic resources in considering agricultural land: Soil, water, grass, forests. Each is regarded as renewable. Through the proper means and methods of production, each can be used profitably forever.

Total cropland, 458 million acres, declined by 8 million acres (2 percent) from 1954 to 1959. Acreage of harvested cropland decreased 6 percent. Acreages of cropland used for pasture, soil improvement, cultivated summer fallow, part of conservation reserve and new land development are included in the cropland total.

Cropland reached a peak of 480 million acres in the 1920's. In the late 1930's there was a decline of 13 million acres, and a regain of 11 million acres in the 1940's. Since 1950, cropland acreage has dropped 21 million acres, and is now at the lowest point since 1910.

Grassland pasture and range declined 22 million acres from 1930 to 1959. This change came largely through reversion to forest and through nonfarm use. There was a considerable interchange between cropland and pasture in the good land areas. Conservation and crop allotment programs resulted in large shifts from cropland to pasture.

Since 1920 total acreage of cropland, grassland pasture, and range changed only a few percentage points, but significant changes occurred within and between the major use classes. Land for crops and pastures has been gradually reclaimed by drainage, flood control, irrigation, and brush clearing. In some regions cropland is concentrated more and more on the fertile and level land areas, while hilly and eroded land is shifted to grass and trees. Average yields increased with the shift of field crops to better soil areas.

Land on the fringes of urban, industrial, and other developments often is partly abandoned, because nonfarm jobs pay more than farm jobs and because of higher tax rates.

#### CONSERVATION-NEEDS INVENTORY

In 1961, the Department of Agriculture obtained the first comprehensive knowledge of the extent and condition of privately owned land.

Five years of intensive surveys, aided by electronic data processing methods, have provided the first National Inventory of Soil and Water Conservation Needs. Sample surveys were made in 3,000 counties of the 48 contiguous States.

The Inventory analyzes current use of land and trends in land use, in terms of a land capability classification, introduced by the Department of Agriculture some 20 years ago. It also gives information on major soil and water conservation problems and shows the size of the conservation job still to be done on private land.

#### Land classified by capability

Scientists and farmers have found that soils, like people, have different capabilities. Also, like people, soils are affected by environment -- by the climate or by location, whether in a flat area or on a steep hillside.

Thus, soils are classified according to their capabilities for safe, continuing, productive use.

Land capability has two broad groupings: (1) Land generally suited for cultivation and (2) land generally suited only for uses other than cultivation. Each broad grouping has four classes. The hazards and limitations of use increase as the class number increases. Class I has few or no limitations or hazards; Class VIII has many limitations.

At the one extreme, Class I land is suited for cultivated crops, for pasture and range, for woodland and for wildlife. Class VIII land, however, is suited only for recreation, wildlife, or water supply.



### More cropland available

The Conservation-Needs Inventory found that nearly half of privately owned agricultural land, about 640 million acres, is suitable for regular cultivation (Land Capability Classes I, II, and III). Almost 60 percent of this acreage is now being used for cropland. The balance assures us a comfortable reserve that could be cultivated when needed.

### Nonsuitable land in cultivation

Nearly 50 million acres, however, that is better suited for permanent grass or trees is in cultivation. This is about 30 percent of the 170 million acres of Class IV land. It creates a continuing problem in conservation.

Land of the other four classes is used mainly for grazing and forest in accordance with its capabilities. Only about 25 million acres of Class V to VIII land is being used (improperly) as cropland.

With some exceptions it would be desirable to convert most of the Class IV agricultural land and all of Class V to VIII agricultural land to permanent vegetation.

The Conservation-Needs Inventory, through its basic soil and land-use data, offers a county-by-county guide to needed land-use adjustments.

The dominant factors limiting capability of land for agricultural use and presenting problems of soil and water conservation are:

- Erosion on 53 percent of problem acreage (738 million acres);
- Excess water on 17 percent (246 million acres);
- Unfavorable soil on 25 percent (352 million acres);
- Adverse climate on 5 percent (75 million acres).

Despite great progress in conserving farm land, there is much to be done.

The 101 million acres, expected to shift to new uses by 1975, will need establishment of new conservation practices.

Sixty-two percent of our present cropland (272 million acres) needs conservation treatment. The dominant conservation problems are erosion on 161 million acres, excess water on 60 million acres, unfavorable soil on 36 million, and adverse climate on 14 million acres.

Almost three quarters of private pasture and range land (364 million acres) needs conservation treatment. Major requirements are establishment of cover on 72 million acres and improvement of cover on 107 million acres. Protection from overgrazing, fire, erosion, rodents, and brush and weeds is needed on 185 million acres.

More than half of private forest and woodland (241 million acres) needs conservation treatment. Major treatments needed are establishment of new stands on 69 million acres, improvement of existing stands on 160 million acres, and erosion control on 12 million acres. More protection is needed to stop losses from fire on 252 million acres, from insects and diseases on 207 million acres, and from animals that damage trees on 82 million acres.

Two-thirds of the Nation's small watersheds need community projects for flood prevention and water management.

Of the more than 12,700 creek-size watersheds in the U. S. mainland about 8,300 need project action to deal with problems requiring treatment beyond the ordinary means of individual land owners.

The most widespread types of watershed problems needing project action are:

- Reduction of flood damages in 6,300 watersheds.
- Control of critical erosion areas in 4,700 watersheds.
- Drainage in 3,900 watersheds.
- Irrigation development in 2,600 watersheds.

Many watersheds need project action for two or more of these purposes.

These projects offer opportunities for communities to meet future demands for water and recreation facilities, expected to exceed the needs shown at the time of the Inventory. They also make new jobs for local people, bring in new industries, and stimulate rural economic development.

#### Classification aids wise land-use

Increasing use of classification as a guide to land use reveals a growing individual interest in natural resource management. Soil surveys, new combinations of farming practices and technology, and land-capability classifications all point to more productive long-term systems of management.

As our land knowledge grows, new machines, chemicals, and plants are introduced. They have increased the productivity of some soils more than others. Some of today's most productive soils were considered poorly suited to crops only a few years ago. Other soils, once regarded as good for cropping, now give better dollar returns growing pulpwood or grass. Interpretations of soil surveys change with management and economic conditions. The accuracy of interpretations grow more important and valuable as technology grows.



## LAND-USE AFFECTS WATER SUPPLY

Along with rapid population growth in this country has come an awareness of our critical water problems. In some places we are actually short of water; in other places our water is polluted or otherwise of low quality. This awareness has led to new techniques in water-use and treatment. Water on our farmlands, ranchlands, and forestlands can be managed to reduce erosion, reduce sediment and floods and, at the same time, yield the maximum amount of good water for many uses.

The program of protecting watersheds, and preventing floods combines conservation treatment of watershed lands with the building of multi-purpose reservoirs--to reduce floods, supplement water supplies, and improve recreation.

By sharing the cost of conservation under several USDA programs, farmers and the public have already shifted millions of acres of farmland, have protected and improved millions of acres and have reforested millions of acres of farm woodland.

## *Timber*

### LAND IN TIMBER PRODUCTION

About one-fourth of the Nation's land area is used for timber production. These 530 million acres of commercial forest land are 70 percent of the 773 million forest acres in the United States. And, about three-fourths of the commercial forest land is privately owned; mostly in small farm tracts.

Softwood sawtimber is the backbone of timber production. About 80 percent of the sawtimber inventory volume is in softwood. About three-fourths of the Nation's total timber volume is in trees large enough to be manufactured into lumber, and sawlogs constitute by far the largest portion of the timber products harvested each year. As the western old-growth is harvested and eastern stands develop, softwood production will gradually shift to reflect more closely the location of the Nation's commercial forest land, 75 percent of which is east of the Rockies, mainly in the Southeast.

Timber production is time consuming and complex. A unique aspect of growing timber as a crop is the time required from seedling to harvest. Much of the timber needed 40 to 50 years from now must come from trees established and growing now.

Species of trees, size, stocking, growth rates, and damage from fire and pests vary significantly. Quality, especially in hardwoods also varies widely -- with values ranging from saleable culls to individual trees worth hundreds of dollars for high-grade veneer timber.

#### SMALL PRIVATE FORESTS

More than half of the commercial forest land in the 48 contiguous States is in about 4.5 million individual ownership units, averaging 59 acres in size. Moreover, 86 percent of these units and 46 percent of this area involves forest tracts of less than 100 acres. About three-fourths of all small forests are on farms and one-fifth of all farm acreage is forested. Farm forest tracts average only 47 acres but they account for one-third of the entire Nation's total commercial forest land. About 97 percent of small private ownerships are in the East.

Productivity of forest land in farm and other small ownerships is far below potential. Substandard stocking after cutting is especially serious. Also, small ownerships are the least adequately protected from fire, insects, or other losses. Timber quality is uniformly poor. Volumes per acre are far below optimum growth conditions and relatively few small forest properties are under management to produce timber volumes efficiently.

#### FUTURE TIMBER SUPPLIES

The major consideration in the present timber situation is the need to prepare for the future. Most forests need improved management to realize full growth potential. Inventories must be adjusted to provide the growing "capital" to meet future needs. Growth must be stimulated to assure adequate volumes in the various qualities and quantities of raw materials required in the years ahead.

One-fourth of the Nation's commercial forest land is inadequately stocked. Almost half of this area is nonstocked and will require planting to be restored to productivity within a reasonable time. On the remainder, natural regeneration, improved protection, and better management practices should be effective in achieving better stocking.

Improved harvest and culture are needed on millions of acres to increase the growth and quality of timber products. Removal of cull and defective trees, release from competing vegetation, and pruning and thinning of immature stands are only a few of the measures needed.



# *Farm Real Estate*

## HIGHER VALUES

Farmland values have risen steadily. Between 1947-49 and the spring of 1962, the market value rose 83 percent. After a slight decrease in sales during 1960, and declines in farmland prices in some regions -- particularly the Corn Belt -- 1961 brought increased activity.

Better outlook for farm goods prices, the nonfarm recovery, expectations of further gains in farm real estate values, lower interest rates, and increase in credit supply all affected the farm real estate market.

An unusual relationship developed between land values and farm income after 1953. Values increased a third while net income changed very little. As a result, farm real estate prices increased to about 10 times net income per acre by 1959, compared with 6 times in 1950-54 and in 1935-39.

Land offered for sale declined despite a strong demand at firm prices. Hope of further capital gain builds demand. At the same time, it tends to discourage sale.

## LOWER RETURNS

The sharp rise in farm real estate prices between 1955 and 1960, with only slight changes in net returns, reduced the rate of return (on current market value) to about 3 percent in 1959. Higher net returns in 1960 and 1961 reversed this trend, however, and the rate rose to 4.1 percent in 1960 and to 4.9 percent in 1961. With further increases in land prices in 1962, net income would need to increase about 5 percent to maintain the 1961 rate of return on the higher market value of farm real estate.

Farmland long has been considered a good hedge against inflation, but its rate of capital gain has been much less than that of common stocks. During 1950-60, 500 common stocks had a net average gain in purchasing power of 19 percent a year, compared with 3 percent for farmland. Combined return from capital gains and from dividends was about three times that from farmland.

## SALES VOLUME LOW

In the year ending March 1, 1962, about 92,000 farms and tracts of land were sold voluntarily. This was the smallest number since the early thirties, and 1 percent less than the year before. Sales resulting from the settlement of estates continued at the same rate as in recent years, and probably amounted to an additional 30,000 changes in ownership. Such estate sales now represent a big portion of all farm properties on the market in some areas.

Farm foreclosures and other distress sales remained at 5,000 to 6,000, the prevailing rate since the early forties. Delinquent tax sales are now practically unknown in most parts of the Nation.

Transfer of land parcels from one farm to another, accounted for about one fourth of all sales in the last 3 years. Such transfers generally occur as farm operators enlarge their operations during their most productive years, then cut back as they grow older. A fifth of the complete farms sold were added to the buyers' farms.

Land bought to enlarge farms accounted for 46 percent of all transfers, compared with only 26 percent in 1950-54.

Active farmers made 65 percent of all purchases and 63 percent of all farm real estate sales in the past year. Nonfarmers accounted for 32 percent of all purchases. Tenants continued to decline in relative importance as buyers.

Factors contributing to differences in sales prices among farms are land quality, buildings, access roads, distance to towns and cities, and acreage allotments of the major crops to be grown.

## *Nine Farming Regions*

More than 500 type-of-farming areas and 400 subtypes have been outlined in the U.S. There are, however, nine major farming regions. They differ in soils, slope of land, climate, distance to market, and in storage and marketing facilities.

Over the years, the general type of farming best suited to each region has developed, although traditional crops may be less important now.

The Corn Belt has deep, rich soils adapted to mechanization. Temperatures and rainfall favor corn production, a preferred livestock feed. Corn, beef cattle, and hogs are the major outputs of farms in the region. Oats, barley, wheat, soybeans and grain sorghum are also important crops. Dairy products, fruits, and vegetables are produced in several localities.

In the Cotton Belt States, although the principal cash crop is cotton, tobacco, peanuts, fruits, vegetables, rice, and sugarcane are also grown. Livestock production has gained in importance with improved pastures. Large acreages of corn have become available for poultry and livestock feed, as tractors replaced mules and horses.

The Lake States and Northeastern regions are the Nation's principal dairy areas. They are adapted to forage, small grain, and pasture crops. Fruits, vegetables and poultry are produced in volume in some areas.



Agriculture in the Great Plains is restricted by low rainfall, and in the northern part by cold winters and short growing seasons. Nearly two-thirds of our winter and spring wheat is produced in the region. Other small grains, forage crops, hay, grain sorghums, and pastures form the basis for beef cattle and dairy production. Flax, potatoes, and sugar beets are adapted to some localities. The Southern Plains is a major cotton area. Large, level fields have enabled the Plains to become one of the most highly mechanized regions. Similar factors have resulted in the Pacific Northwest becoming another highly mechanized and productive wheat area.

Vast areas of the Western and Southwestern States are suited for cattle and sheep production on ranges. Low rainfall limits cultivation of crops, but irrigation in scattered valleys makes possible such crops as sugar beets, potatoes, beans, fruits, vegetables, and alfalfa hay.

## CHAPTER III

# FARM PRODUCTION

### *1962 - More Produced on Less Land\**

Twenty-three million Americans, four of each ten workers, are part of our agricultural production. Nearly 7 million work on farms, 16 million supply farmers or market farm output. Their combined labor provides food and fiber, in unparalleled abundance, for 188 million Americans, plus exports.

American farmers filled the horn of plenty again in 1962: They boosted yields per acre to a new record high. Production of livestock and livestock products tied last year's record. Output of five major crops - corn, grain sorghum, oats, barley and wheat - was less than domestic consumption plus exports and will result in lower carryover stocks of grains. Total farm marketing was slightly higher than the previous record of 1961.

Total crop production was 1 percent above the preceding year, when 2.6 percent more acres were harvested. Reductions came largely through the 1962 Feed Grain Program. Weather was good in many regions and helped boost some crop yields well above previous record levels.

Output of meat, milk, and other livestock products was about the same as in 1961 but 5 percent above 1960. Records were set for beef, broiler and milk production.

By tripling cropland and adding 70 percent more farm labor, agricultural production increased 300 percent in the half century before World War I. Farm production in 1962 was about double that of 1915, but it was produced with less land and fewer workers.

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\* See Highlights of 1962, page 130.



## HIGHLIGHTS OF 1962 PRODUCTION\*

Red meat output was at a record of 29 billion pounds -- the result of slaughtering 27 million cattle, 17 million sheep and lambs, and about 84 million hogs. Poultry meat output was up, reaching an all time high of 7.2 billion pounds. Farmers raised 2 billion broilers (86 percent of the chicken meat supply), and 92 million turkeys for market in 1962. This was 2 percent more broilers and 15 percent fewer turkeys compared with 1961.

Milk production registered a record total of 125.9 billion pounds, half a billion higher than a year earlier.

Egg production reached 17<sup>1</sup>/<sub>4</sub> million cases, the output from a total flock averaging 296 million layers.

Shorn wool production was 248 million pounds. This is 6 percent below 1961 and 1 percent below 1956-60 production.

The 1962 wheat crop, at 1,092 million bushels, was 12 percent smaller than a year earlier. Total use will exceed output and bring a decline in carry-over stocks. Hot, dry weather at heading time reduced the crop in the winter wheat area. Yield per acre was a new high for spring wheat, 27.4 bushels, compared with an average of 17 for 1951-60.

The rice crop, at 64.5 million hundredweight, was 19 percent above the 1961 crop and a new record. Yield was 37 cwt. per acre, compared with 29 for 1951-60.

Edible fat, oil and oilseed supply was a record 16.6 billion pounds, 5 percent more than a year earlier. The 1962 soybean crop of 675 million bushels was nearly 1 percent smaller than the previous year's record, but cottonseed, peanut and flaxseed output was larger than in 1961.

Cotton production at 14.7 million bales was slightly above the preceding year.

Production of the four feed grains (corn, grain sorghum, oats and barley) was 143 million tons in 1962, nearly 2 percent more than in 1961. Each crop set new yield records (corn-64 bushels compared with 46 bushels in 1951-60; oats-45 bushels compared with 37; grain sorghum-44 compared with 26; barley-35 compared with 29). Higher yields more than offset acreage reductions while grain sorghum yield and acreage were both above 1961. However, production is below what we will need before the next harvest.

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\* See footnote on page 27



Fresh market vegetable and melon production was slightly less than in 1961 but 4 percent above average. 1962 saw record crops of sweetcorn and cantaloups, and larger crops of carrots, onions and watermelons were estimated. Production of cabbage, celery, lettuce and tomatoes was lower than in 1961. Production of 10 principal processing vegetable crops reached a new high, 13 percent more than in 1961. Tomato output hit a new high and this one crop accounted for 57 percent of 1962 tonnage of all processing vegetables.

Citrus production for the 1962-63 crop year is expected to be well below that of 1961-62. Remaining fresh supplies are about half of last year, but processed stocks are higher (February, 1963). Processed stocks will be rapidly used up. Greatest decline is for oranges, mainly because of the December freeze in Florida. Non-citrus production was about the same as in 1961.

Tobacco production was nearly 10 percent above 1961.

The hay crop totaled 121 million tons, the largest on record, 4 percent over 1961. Yield per acre was 1.8 tons.

Sugar crop production was well above previous year levels; 10 percent above 1961 for sugarcane, and 3 percent for sugar beets.

Timber production in 1962 reflected trends to use of competing construction products. Round timber products were estimated at 10.5 billion cubic feet, slightly above 1961, but below the post-war peak of 11.5 billion cubic feet in 1956; lumber production is estimated at 32.5 billion board feet, 2.5 percent more than 1961; pulpwood production, at 44 million cords was a new record. About 33 to 35 million Christmas trees were supplied by U. S. producers.

Total naval stores production in the 1961-62 crop year included 153,000 barrels of gum turpentine and 474,000 drums of rosin, 28 percent more than 1960-61 and the largest production since 1954. Steam distilled and sulphate turpentine production were 151,000 and 333,000 barrels, about the same as in 1960-61. Steam distilled rosin was down 9 percent at 1.1 million drums, while tall oil rosin was up 12 percent to 471,000 drums.

Comparisons of total 1962 output with recent years are shown in the following table:

FARM PRODUCTION: Index numbers of total farm  
output, gross production of livestock and crops,  
and related indexes, United States  
(1947-49 - 100)

Item	1958-60	1960	1962
Farm output	126	128	130
All livestock and livestock products. . . . .	126	126	132
Meat animals . . . . .	126	125	131
Dairy products . . . . .	110	110	113
Poultry and eggs . . . . .	149	151	160
All crops. . . . .	119	121	121
Feed grains. . . . .	139	143	131
Hay and forage . . . . .	119	119	122
Food grains. . . . .	107	111	94
Vegetables . . . . .	107	108	114
Sugar crops. . . . .	129	130	154
Cotton . . . . .	94	100	103
Tobacco. . . . .	90	96	112
Oil crops. . . . .	169	170	199
Cropland used. . . . .	94	93	86
Crop production per acre .	127	130	140
Animal units of breeding livestock	99	97	100
Livestock production per breeding unit	127	130	132

### WHY PRODUCTION INCREASES

No single magic wand accounted for today's miracle of agricultural production. Agricultural research investments have paid off handsomely in improving efficiency and increasing our production potential. Farmers today are much more knowledgeable, much better equipped and much better managers than a generation ago.



Total resources used in agriculture including land, labor, machinery, supplies and other inputs, have increased only 20 percent since 1910. But farm production has doubled through complex changes that include the use of about 5 times the mechanical power and machinery; almost 10 times the amount of fertilizer and lime; 7 times more manufactured rations for animals; commercially grown seeds of hybrid varieties or improved strains and improved livestock; and about double the miscellaneous inputs, including disease and pest control chemicals. We use less than half as much farm labor as in the 1920's and early 1930's.

Land has undergone the least change in the past 50 years of all the economic inputs; we have shifted crops to better acres to some extent, and conservation methods have built and maintained fertility on many acres.

#### POTENTIAL IS DIFFICULT TO MEASURE

The effects and potentials of the forces shaping modern farm productivity are many, varied and hard to measure. For example:

Scientists and economists met in 1954-55 to appraise yield possibilities for each major crop in 1975. These men considered historical yields, yield potentials, the extent of irrigation, and the geographic distribution of acreage and production to estimate economic maximum and economic attainable yields. They studied the rate at which farmers had adopted technological advances in the past, and used the years 1951-53 as a base period for estimating potentials for 1975.

A comparison of their projections for 1975 with 1961 crop yields gives an idea of agriculture's unexpectedly rapid progress in recent years.

By 1961, the rise in crop production per acre had accounted for 80 percent of the increase in economic attainable yields projected for 1975, and 50 percent of the gap between production per acre in 1951-53 and that projected for the economic maximum.

Yield of corn, the major crop in the United States (20 percent of our total crop production), in 1961 exceeded by eight-tenths of a bushel the economic maximum forecast for 1975. Yield of sorghum grain exceeded the maximum by 1.8 bushels.

The economic structure of U. S. agriculture is such that no farmer can affect his commodity prices through his own production decisions. More production at lower (or the same) unit costs is therefore, the goal that farmers seek. Under pressure of lower farm prices, farmers will try to make better use of their land, buildings and other fixed assets, use more family labor, and try to cut down cash buying.

(Refer to table on page 27.)



Crop yields of 1962 and comparable periods in the following table show how rapidly efficiency is increasing in 11 major crops:

Yields of selected crops per harvested acre: 1951-53,  
1958-60, 1962, and 1975 projected

Crop	Unit	1951-53	1958-60	1962*	1975 Projections 1/	
					Economic	Economic
					Attainable	Maximum
Corn, all	Bushel	39	53	62	53	61
Oats	Bushel	33	42	45	42	52
Barley	Bushel	28	30	35	35	42
Sorghum grain	Bushel	18	39	44	35	42
Hay, all	Ton	1.4	1.7	1.8	1.8	2.1
Soybeans for beans	Bushel	20	24	24	26	30
Peanuts, picked and threshed	Pounds	925	1,186	1,273	1,357	1,877
Wheat, all	Bushel	17	25	25	24	27
Rice, rough	Cwt.	24	33	36	41	48
Potatoes	Cwt.	147	178	194	208	276
Cotton	Pounds	291	459	455	495	616

1/ These projections were made initially in 1954-55; most of the yield projections were reviewed and revised in 1957-59.

\* For full details and discussion of production, acreage and yield write to: Statistical Reporting Service, USDA, and ask for 1962 Annual Summary of Crop Production, by States (issued December 18, 1962).

# *Technology*

## THE FAMILY FARM

A machine age and a continuing technological revolution have come to American agriculture. The result has been emergence of the efficient, commercial family farm as the dominant producer of food and fiber in the United States.

The family farm operator who succeeds today uses knowledge of genetics, land and water use, conservation, chemistry and physics with business management ability. He combines modern science and ancient art with machine power. The result is great efficiency -- an abundance of food, clothing, and other materials for home and industry.

## The changing family farm

Man has always been dependent on natural plants and fibers for most of his food and clothing. The struggle just to grow enough food has bound most men, in all countries and all times, to the land. From the time of Christ until the 19th century, man made little progress in improved methods of growing plants and animals. In 1820, a farm worker in the U. S. produced enough food and fiber for himself and only three others.

The machine age brought new tools, new power, and other employment opportunities. Farm production had to increase to meet the needs of an increasing population. Increases were aided by improvement of farming tools, through agricultural research, education, and mass communication of better methods.

The family farm is not losing its dominant position in American agriculture though an adequate family farm is larger today than ever before. The amount of work done by both family workers and hired workers declined during the 1950's, at about the same rate, but the rate of decline in man-years of hired labor was generally faster.

Family size farms accounted for 67 percent of all farm marketings in 1949, 74 percent in 1954. Preliminary indications are that about the same relative change took place during 1954-59 as occurred in 1949-54.

The fastest expanding group of farms is that using less than 1.5 man-years of hired labor and producing \$10,000 or more marketings. This group of farms grew from 334,000 in 1949 to 632,000 in 1959, an 89 percent increase.



Mechanization has made possible such examples as an Iowa farm, a 17-man farm in the 1930's, operated today with the same acreage and enterprises by only 3 men; and seven adjacent small family farms in Oklahoma that between 1949 and 1956 became a single farm operated by two men, with part-time assistance from a third.

### Farming and nature

The sequence of the physical forces in growing crops and animals has changed but little between 1492 and 1962. Nature limits the number of farming operations that can be done at the same time; man still plants the seeds of corn in the spring and sees the full grain in the ear some 90 days later.

The natural processes of birth, growth, and maturity cannot usually be fitted to an assembly line. This natural sequence calls for peak workloads for planting, cultivating, and harvesting. Maintaining a large work force through the year is impractical.

But, the impact and the benefits of machines are greater in farming than in industry. With mechanization of most kinds of farms, output per man-hour of farm workers increased at an annual rate of 5.1 percent during the 1950's, more than twice the rate for workers in nonfarm industry. Mechanization accounts for almost a quarter of this increase.

Studies show that there are few economies of bigness (a major force in many industries) above the largest acreage that a farm family (with up to  $1\frac{1}{2}$  man years of hired labor), well-equipped with modern machines, can operate. Some exceptions occur in incompletely mechanized farming operations, production of some fruits and vegetables, and in the feeding of poultry and livestock where the rapid sequence of feeding times makes "factory farming" operations possible.

### The American way refutes Malthus

The sequence of farm operations is little changed from the time when Thomas Malthus stated that population increases in geometric ratio and food supply in arithmetic ratio; that malnutrition, starvation, disease, pestilence, and wars kill off the population until its numbers come into balance with the food supply at bare subsistence levels. Conditions that led Malthus to these conclusions can still be observed in many parts of the world.

In the United States, after the virgin continent had been occupied and our tillable land frontier had been reached, we found a new way to offset the Malthusian law: Technological advances. Technology continually strengthens our Nation, and increases its stature among all lands and peoples of the world. Farm technology in the U. S. is the result of our basic concept of government to provide individual freedom, promote individual welfare, and thereby achieve national progress.



National policies have, for almost two centuries, encouraged development of the family farm through land distribution and agricultural research, education, and credit. Progress has been continuous, as farmers have free access to each advance in the science and art of farming. There have been no secret processes in agriculture to provide advantages to individuals or corporations that would squeeze out smaller producers. The holding and working of agricultural lands has remained in the hands of the individual farm family, in the basic American tradition.

### Basic definitions

A family farm is a business in which the operating family does most of the work and is a risk-taking manager in the financial returns. Such a family may be full owners, part owners or renters; they may also engage in contract farming.

Today, given the benefits of modern roads and vehicles, with quick access to the city, people live on farms according to the needs and desires of the individual farm family. Many farmers reside in town and still are able to keep a close watch over their crops and livestock.

By definition, three worker equivalents (man-years) of labor is considered the upper limit of the family farm. If more labor than this is required, the average family could not do most of it. Generally, then, a family-size farm is one which uses less than 1.5 man-years of hired labor.

For a stable operation, a family farm must be big enough to produce enough to: Pay expenses, including maintenance and interest on investment; provide cash surplus to buy and maintain the machines and goods needed to grow in pace with the national economy; and permit family living at an acceptable level.

Since the number of farms that produce \$10,000 or more of marketings is increasing, it is assumed that they have sufficient resources and productivity to meet these conditions. This indicator of minimum sufficient resources (\$10,000 of sales) will change with changing price levels, requirements of technology, and rising levels of living.

A larger-than-family farm (institutional, corporation, and other terms are often included in this category) is a farm business in which most of the labor is hired. This means that, on the average, farms using 1.5 man-years or more of hired labor are larger than family-size.

High production alone does not explain family farms and larger farms.

Studies indicate that minimum costs per dollar of output for most types of farms are achieved within the limits of family-size farms. Through substitution of machines for hired labor, hitherto larger-than-family-size farms have dropped into the family size category.

### Trend to specialization

Diversified farming systems, long used for better use of labor and machinery and helpful in preventing erosion and maintaining soil fertility, have in recent years been subject to strong economic pressures. The cost of additional equipment required for varied operations, low returns from some crops, and the possibilities of greater profits from intensive production of one or a few products have resulted in more specialized operations.

Another major factor in the trend toward increasing specialization is that it takes a lot more skill and specialized knowledge than ever before to compete successfully in the production of any given farm product. Thus, farmers specialize partly because they reach the effective limit on the number of productive processes on which they can keep up to date.

Such specialization often involves greater risk of crop failure and consequent low profits. One aim of modern technology is to give the farmer better control over nature and thus reduce production risks to some extent. Cases in point would be supplementary irrigation, crop varieties that resist drought and diseases, shorter and stronger cornstalks that blow down less easily in a storm, more effective pesticides, and new medicines and drugs to prevent and control animal and poultry diseases.

The need for skilled farm management has increased as farms get bigger and more capital is needed. Farmers are more skilled, as is seen in steadily increased crop yields and continued advances in livestock and poultry production efficiency. Successful family farm managers must use modern farm methods and perform many jobs with complex tools and machines.

### Machines and productivity

The principal change that machines make in agriculture is in the expansion of the work one man can do. Only one man is needed now to do the farm work that four did in 1930. If this were not so, 28 million men, not 7 million, would be needed to produce our output.

Because of machines, fewer man hours are needed to farm a given acreage. Fewer farms are one result. National economic growth has made it possible for many, but not all, displaced farmers and workers to get jobs in industry or business. In reverse, release of farm labor has made possible national economic growth.



## POWER FOR PRODUCTION

In many respects today's farming methods bear little relation to those of our parents' and grandparents' day. Consider power: In 1910, virtually all farm power was supplied by farm reared horses and mules. In 1940, more animal than mechanical power was still being used. Today, animal power is insignificant. Only 3 million horses and mules are on farms today, compared with more than 20 million as late as 1928. More than 40 million acres have been released from the production of feed for draft animals.

The engines now used on farms have 190 million total horsepower, more than the combined power of mechanical engines and turbines of all the Nation's factories, private and commercial aircraft, railroads, merchant ships, and mines.

### Petroleum

Farm fuel consumption for tractors alone has more than tripled since 1940 to 4.3 billion gallons in 1959 compared with 1.4 billion in 1940. Farm autos, trucks, and tractors used 7 billion gallons in 1958. Farmers spend almost \$1.6 billion for gasoline and other oil products in the farm business, and \$330 million for fuel used in their personal autos.

Fifteen billion gallons of crude petroleum were needed to provide refined petroleum products for our farms in 1957, or 13 percent of total U. S. production. This is more petroleum than any other single industry uses.

Farmer cooperatives alone handled \$596 million in petroleum products in the year 1959-60. Petroleum products represent almost a quarter of the value of farm production supplies handled by cooperatives, and a fifth of the total petroleum used by all farmers.

### Electricity

Some 97 percent of U. S. farmers now have electric power. Farmers used 25 billion kilowatt hours of electric power in 1960, compared with 22 billion kw-h in 1956 - about 4 percent of the Nation's total and more than is needed annually by the cities of Baltimore, Chicago, Boston, Detroit, Houston, and Washington, D. C. About \$150 million was spent on electricity for production.

In 1947-49 electricity used per farm averaged about 225 kilowatt-hours a year. By 1955 use had increased to slightly less than 400 kw-h; by 1960, to more than 500.

### Steel

Farmers use more than 5 million tons of steel yearly, more than 7 percent of total U. S. production -- enough to make almost 5 million compact cars. It



has been estimated that farm consumption of steel is responsible for almost 40,000 jobs in the steel industry, almost \$200 million worth of payroll.

### Machines and engines

The farm provides a continuing market for engines, electric motors, and the machines they power, but buying has dropped off from the post war period.

Farmers invested \$2.6 billion in motor vehicles and farm machinery during 1960, nearly half a billion less than in 1959. Tractor purchases were cut back to \$499 million, \$278 million less than in 1959, and the lowest since 1947. Farmers cut back buying of other farm machinery \$107 million, and spent \$30 million less for automobiles and motor trucks. In 1961, expenditures increased slightly.

Total numbers of selected machines increased during 1960. The value of inventory dropped \$400 million from the record high of \$18.6 billion on January 1, 1960, as \$3.6 million in depreciation charges more than offset gross purchases. The value of inventory increased \$41 million during 1961.

The count of farm machines in 1954 showed farms to have 4.3 million tractors, 1 million combines, and 700,000 cornpickers. While the number of farms decreased a million by 1961, the number of machines increased to 4.8 million tractors and 805,000 cornpickers. There were a million grain combines on farms in 1961, 3.6 million autos, and 2.8 million trucks.

The number of other machines also climbed: Pickup balers, from 450,000 to 675,000, and field forage harvesters, from 200,000 to 300,000.

The average horsepower of farm tractors produced in 1961 was double the 1940 average, and 8 percent above 1960.

Almost half of the new farm tractors were of the higher priced diesel type. Farmers still buy primarily to replace old machines. Numbers of tractors, combines, and cornpickers appear to have reached a peak.

Farmers are still eager to increase efficiency through greater mechanization. Large numbers of field forage harvesters, field balers, bulk milk tanks, pipeline milkers, and a variety of other equipment are still needed.

### TECHNOLOGY IS EXPENSIVE

Farmers are important customers of business and industry.

They spend about \$28 billion a year for equipment, goods, and services to produce crops and livestock. They probably spend another \$15 billion a year for family living items.

Some average annual purchases by farmers include:

- \$2 to \$3 billion for new farm tractors and other motor vehicles, machinery, and equipment.
- \$3.5 billion for fuel, lubricants, and maintenance of machinery and motor vehicles -- including more petroleum than any other single industry uses.
- \$1.5 billion for fertilizer and lime.
- 25 billion kilowatt hours of electricity, about 4 percent of the Nation's total, and almost the total electric energy produced for use in the cities and towns, industrial plants, and on the farms of the six New England States.

Six million people have jobs today providing the machines, industrial goods, and services farmers use.

And farmers, potentially, are even better customers of business and industry. Agriculture can grow as population grows, and consumption increases.

### Income and spending

Gross farm income (including nonmoney income and Government payments) was over \$40 billion in 1962; compared with about \$37 billion in 1952, nearly \$19 billion in 1942 and less than \$7 billion in 1932.

Net income, as a percentage of gross income, has almost steadily declined since the end of World War II: Net was 32 percent of gross income in 1962, 41 percent in 1952, 47 percent in 1942.

Average gross per farm rose from \$7,200 in 1955 to \$11,000 in 1962. Net income rose from \$2,500 to \$3,500. Average annual wage per employed factory worker rose from \$3,900 in 1955 to more than \$5,000 in 1962. (See Farms Produce More, page 6.)

Farmers had about \$7.2 billion of personal income from nonfarm sources in 1962 (such as wages, dividends, social security payments) compared with \$6.6 billion in 1952 and \$3.8 billion in 1942.

From 1954 to 1959 spending per farm increased 21 percent for feed, 12 percent for hired labor, 24 percent for machine hire, and 13 percent for gasoline and other oil products for the farm business. Total farm operating expenses reached a record high of \$27.7 billion in 1962, more than \$7,500 per farm.



Here is a preliminary estimate of what farmers spent for farm production items in 1961:

Million dollars

Autos (production use only).....	\$ 322
Trucks.....	480
Tractors.....	602
Other farm machinery.....	1,236
Dwellings.....	735
Service buildings.....	837
Repairs and operation.....	3,823
Dwellings and service buildings.....	(608)
Motor vehicles and farm machinery.....	(1,669)
Petroleum, fuel, and oil.....	(1,546)
Hired labor.....	3,048
Pesticides.....	310
Seed.....	521
Containers.....	141
Electricity.....	157
Telephones.....	141
Binding materials (such as twine and wire).....	67
Miscellaneous hardware.....	162
Feed.....	5,000
Livestock.....	2,700

Today's average farmer uses about 70 percent of his gross farm income for the goods, materials, and services for farm production, compared with 60 percent in 1952. (See Section on Prices Paid, page 111.)

Fewer farmers, more spending

Even though there are fewer farmers each year, total production expenses continue to climb: \$6.7 billion in 1940, \$19 billion in 1950, and \$28 billion in 1962. Number of farms decreased from 6.1 million in 1940 to 5.4 million in 1950 to 3.7 million in 1959. While numbers of farmers and farm workers continue to decrease, total buying of all farmers, as well as buying per farm, will probably continue to rise.

Variations in production spending

In 1962, the average farmer spent more than \$7,500 for production expenses.

In 1955 he spent \$5,600 - \$2,500 if he farmed in the East South Central States\*, \$12,200 in the Pacific States.

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\* See Glossary, Regions



Wage costs ranged from \$300 in the East South Central States to \$2,500 in the Pacific States. Livestock costs ranged from \$160 in the East South Central States to almost \$1,200 in the Mountain States. Feed costs ranged from less than \$300 in the East South Central States to almost \$2,300 in the Pacific States. Seed expenditures ranged from \$80 in the East South Central States to more than \$300 in the Northeast States.

Operating expenses for vehicles and equipment accounted for only \$280 in the East South Central States, compared with \$1,300 in the Mountain States. Vehicles and equipment purchases ranged from just over \$300 to more than \$1,100.

In 1955 average production expenses per farm were: Wages and custom work, \$680; livestock, \$520; feed, \$880; seed, \$170; fertilizer and lime, \$250; vehicle and machinery operating expense, \$680; rent, taxes and interest, \$930; repairs and improvement, \$290; purchase of vehicles, machinery and equipment, \$580; miscellaneous expenses, \$580.

### MORE CAPITAL INVESTMENTS

Building and fencing materials expenditures in 1961 were only slightly more than the \$1.5 billion in 1960. Farmers tend to defer such major purchases until earnings are high.

Landowners continued to make large investments in irrigation, drainage, conservation, and other land improvements. (Individuals invested over \$500 million in this work in 1955, the most recent year costs were surveyed.) Public funds continued to be spent for conservation, flood-prevention, flood-control, and irrigation projects.

### Barns and buildings

Changes in farming methods and the trend toward specialized farm production make many existing buildings obsolete and inefficient.

New kinds of structures often help reduce production costs. They save labor and make livestock feeding more efficient. Savings in preserving stored crops or in producing livestock, milk, or eggs can offset costs of construction.

Man-made skylines on farms are dwarfed by the pattern of office and factory buildings in cities, but the value of service buildings construction has been about one-tenth the value of all other private nonresidential construction in recent years.

Farmers built service buildings worth \$837 million in 1961, about the same annual total as during the past decade. New farm residences in 1961 were valued at \$735 million. All other private nonresidential construction had a

value of \$10.2 billion in 1960. The percentage relationship of these totals is about the same as in 1940. But the value of farm buildings in relation to the value of land and buildings together has declined from 30 to about 21 percent in 20 years.

By March 1, 1959, value added to farmland by buildings totaled \$29 billion, nearly \$25 per acre of land, or \$6,700 per farm. These totals would be doubled if the valuations were made on the basis of replacement costs instead of actual cost.

### Fencing

Farmers used 141,000 tons of barbed wire fencing in 1961, 90 percent of total U. S. use. They also used 132,000 tons of woven wire fence, 85 percent of total domestic use. If all the barbed wire farmers used in 1961 was strung together to make a 3-strand fence, it would extend more than 300,000 miles, 12 times around the earth.

### Chemicals

More than 50,000 chemical preparations are currently registered with the Government for sale to farmers -- herbicides, fungicides, nematocides, harvest aids, animal health protectants, and many others. More than 80 percent of the volume of agricultural chemicals used today is accounted for by materials that were not available in their present form only 20 years ago.

### Fertilizer and Lime

Fertilizer means low cost and good returns for most farmers. The use of primary plant nutrients--nitrogen, phosphate and potash--has increased more than 300 percent since 1940. More concentrated, better fertilizers at relatively stable prices are responsible, brought about partly by acreage controls.

In recent years using more fertilizer has helped to offset other continuously rising costs of crop production. For a cost about one-tenth of the expense of producing crops, fertilizer is responsible for one-fifth of net agricultural income. On the average, \$3 has been returned to the farmer for every \$1 invested in fertilizer.

Recent studies of fertilizer use show that, at present prices, farmers commonly use less than the most profitable rate of fertilization.



In the year ending June 30, 1961, more than 7.7 million tons of primary plant nutrients (in the form of commercial fertilizers) were used by American farmers, a moderate increase over the preceding year. Nitrogen (3,004,000 tons) increased 10 percent, phosphates (2,597,000 tons available  $P_2O_5$ ) and potash (2,165,000 tons  $K_2O$ ) increased 1 percent. In both mixed fertilizers and direct-application materials, nitrogen was consumed in much larger quantities.

In 1961, about 64 percent of these nutrients were used as mixed nutrients; the balance was used as direct-application materials containing a single nutrient (principally for top-dressing).

In 1940, however, about 70 percent of the total nutrients were applied to crops as mixtures. This change indicates that farmers are now top dressing more heavily to obtain better yields.

In 1961, American farmers spent nearly \$1.4 billion on commercial fertilizers, averaging about \$60 per ton (\$1.88 per unit-ton)\*. In 1940, farmers spent \$256 million, and the average cost per ton was on \$31 (\$1.51 per unit-ton). But, the total primary-plant-nutrient content in 1940 was 20 percent, compared with 32 percent in 1961. Farmers now obtain fertilizers with 60 percent more plant nutrients a ton, at a price only 24 percent higher than in 1940.

In 1959-60, farmers bought \$334 million worth of fertilizer and lime--a fourth of their total needs--through their cooperatives.

According to the 1959 Census of Agriculture, 42 percent of the harvested cropland was fertilized, compared with 37 percent in 1954. Future requirements for fertilizer will develop with increased population growth and education of the farmer in better use of fertilizer products.

Location of fertilizer production has followed the changing pattern of fertilizer use. The Southeastern States used to be the big users of commercial fertilizer, but other areas, particularly the Midwest, have increased rapidly as users, and plant capacity has shifted accordingly.

Fertilizers move from factories to farms in incredibly large quantities during the short planting season. Handling and transportation facilities become loaded to the limit. Weather conditions determine the start, interruptions, and close of the season.

Spot orders may not be filled at the time of critical need. As a result, while requirements vary according to weather, soils and plants, many farmers place orders and lay in supplies of fertilizer long before the planting season arrives.

Besides the three principal fertilizers, secondary nutrients--calcium, magnesium, and sulfur--are now added to the soil in large quantities. These chemicals aid release of plant nutrients that may otherwise be "tied-up" in forms unavailable to growing plants.

\*Unit-ton -- For example, a 5-10-5 mixture contains 20 unit-tons.



Trace elements, including boron, copper, manganese, and zinc, are being added to some soils with good results. Deficiencies of these micronutrients are remedied by applying them to the soil directly, or including them in foliage sprays or mixed fertilizers.

Farmers also used nearly 23 million tons of liming materials in 1960, costing \$115 million.

Agricultural limestone reached its peak use in 1947 (30 million tons), but has remained at about the present level since 1956.

Chemical fertilizers are sold in dry and liquid forms and are applied by field machines, airplanes, trucks, and in irrigation water.

Proper application makes a big difference in plant response and yield. The use of radioactive phosphorous is a new tool in fertilizer research studies. Such research is opening ways for more efficient use.

The introduction of liquid fertilizers has helped the farmer by eliminating the lifting of heavy bags.

Use of liquid fertilizers was practically nil in 1940; in 1961 about 16 percent of total nutrients were applied in liquid form. The trend to larger farms, mechanization, and encouragement to apply nutrients (shown needed by soil tests) has created a new service to farmers - custom service of bulk applicators.

New methods and machines offer major savings in labor requirements, but rising machine prices have slowed the sales of modern equipment to handle concentrated fertilizers. As a result, custom operators service farmers in some areas, and farmer's cooperatives have begun to offer custom services to their members.

Agriculture is expected to use even more fertilizer in the future. Only 11 percent of U. S. farmers used recommended rates in 1959, and 37 percent used none on their cash crops.

### Spraying and dusting

Crop and livestock pests always plague agriculture. These destroyers of food and fiber include not only insects and some animals, but fungi and viruses, and especially weeds.

A century ago, when effective controls were generally unknown, pests were treated with materials such as lime, soot, ashes, elder leaves, plaster, charcoal, and organic dust. Crude and ineffective as these may seem, they were an indication that man had moved away from the idea that visitations of pests were supernatural acts from which there was no escape.

U. S. production and sales of agricultural pesticides continues to grow. More of these chemicals are synthetics than ever before. U. S. production of synthetic organic pesticides alone grew from 570 million pounds in 1956 (valued at \$275 million) to almost 698 million pounds in 1961 (valued at almost \$359 million). About 60 percent of this production goes into U. S. agriculture.

Between 1954 to 1958, value of all prepared agricultural pesticides increased from \$214 million to almost \$347 million. In 1959-60, farmers bought about a fifth of their pesticide needs--\$53 million--through cooperatives.

The extent of control and preventive work against the costly attack of insects, microorganisms, and weeds is emphasized in many statistics.\*

-- Aircraft in 1959 treated more than 43 million acres of crops, orchards, rangeland and forests with pesticides.

-- U. S. shipments of pesticides in 1958 totaled \$347 million, compared with \$214 million in 1954.

Farmers sprayed or dusted more than 92 million acres of cropland and other farmland for control of insects, diseases, weeds, and brush in 1958. Acreage treated for weed and brush control increased 77 percent from 1952-58. Spraying and dusting for insects and diseases increased 28 percent.

An idea of the expense involved in agricultural use of pest control chemicals comes through special surveys and area reports.

In Arkansas, cotton growers dusted 1,180,000 acres an average of five times in 1960 at a cost of \$11 million. The return from insect control was estimated at \$73 million, or about \$62 per acre. The preceding year, Arkansas farmers used a third more dust for estimated savings of \$75 million.

In California, 2.5 million acres of cotton were treated by custom operators in 1960, 92 percent of it by aircraft. More than 7 million crop acres in the State were treated by pest control operators, 80 percent by aircraft.

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\* (Consumption figures based upon direct observations, such as sales at the local level, are available for only a few areas. Pesticide use cannot be calculated from total production and total exports, the first being in terms of technical chemicals, while reports of exports include formulated pesticides.)



## Crop and livestock protection

Pesticides make farming more economical; they also help make it possible for farmers to provide consumers with a variety of high quality foods. Food production as we know it in the United States today would not be possible without chemicals to protect crops and livestock from insects, diseases, and other pests.

All the pesticides used in agriculture, and all the related products used in industry and in homes and gardens, are subject to the Federal Insecticide, Fungicide, and Rodenticide Act, administered by the Department of Agriculture.

Pesticides must be registered if they are to be sold interstate. The Department grants registration only to products that have been proved through research to be both effective and safe for their intended use. Labels on registered pesticides must accurately and clearly describe the product, give proper directions for safe and effective use, and warn users against the hazards of misusing the product.

Department inspectors at ports of entry and border stations guard against invasion of the U. S. by foreign crop and livestock pests. These inspectors halt the entry of dangerous agricultural pests at the average rate of one every 16 minutes around the clock.

Cooperating with States, the Department conducts a number of programs for the control or eradication of agricultural pests that cannot be dealt with effectively by individual farmers. Such programs have led in recent years to eradication of the Hall scale, an orchard pest, from California; the Mediterranean fruit fly from Florida; the screwworm pest of livestock from all the Southeastern States; and the swine disease, vesicular exanthema, from the entire U. S.

## *Materials for Industry*

### Farming a contributor to industry

Agriculture has historically been a producer of food and fiber, but the number of industrial products manufactured from farm products continues to increase each year. Clothing, paint, drugs, chemicals, construction materials, paper, soaps and detergents, solvents, plastics, packaging films, and many other everyday products are made from the abundance of our farms and forests.

In 1961, we used 4.1 billion pounds of cotton, enough for 30 dress shirts or 21 house dresses for every man, woman, and child in the Nation.

We used over 410 million pounds of clothing and carpet wool, more than 2 pounds per person.

We used 432 pounds of paper per person in 1960, the annual growth from about  $3/4$  of an acre.

Three out of four mattresses we sleep on are stuffed with cotton linters, the "waste" cotton fibers.

But, while dollar volume of farm goods for industrial use continues to increase, its relative importance in total farm output has decreased.

Just as the petroleum industry recognized the need for upgrading its raw materials to increase demand and profits, so the farmer is becoming aware that he must find industrial outlets for his products to increase his income and reduce surplus production.



## Competition between natural and synthetic products

Production for industrial purposes has dropped to about 7 percent of our cultivated farm acreage in recent years. This production includes cotton, tobacco, wool, corn starch, and rosin, as well as soybean, linseed, safflower, and other oil seed crops. Woodlands and forests also supply tremendous quantities of materials for industry and construction each year.

Expanded industrial outlets for farm products can help narrow the gap between agriculture's ability to produce and the economy's capacity to consume. The result would be profitable for both agriculture and industry.

Some agricultural commodities are being used in increasing quantities, but per capita nonfood use of farm products has declined substantially. Synthetic fibers (replacing cotton and wool), petroleum-derived detergents (replacing fat-based soap), and synthetic water-base coatings (replacing vegetable oil products) have made heavy inroads into the markets for natural fibers, fats, and oils. Research has enabled the petroleum and chemical industries to offer highly competitive new products for textiles, soaps, and paints, to cite just a few examples.

## Sales of chemical industry

In 1960, the chemical industry's total sales were \$27.7 billion, representing sales of some 11,000 products. Some 400 new chemical products are introduced on the market each year. Most of them are petroleum derived. Some, such as dialdehyde starch, are produced from farm products. (The starch gives paper more wet strength and speeds up the leather tanning process.)

## RESEARCH OPENS NEW USES FOR FARM GROWN MATERIALS

Prospects for a comeback, in areas where farm commodities once were dominant, have brightened in recent years. Increased research, dealing with the properties of and modification of agricultural products, is opening new fields. Since 1958, improvements in the properties of cotton and wool, along with other factors, have reversed the downtrend in use of natural fibers. When easy-care cottons and washable woolens became available, they reclaimed some of the gains achieved by man-made fibers.

But agriculture has lost many markets by default. Until about 1930 the only fibers used in textiles were natural materials -- cotton, wool, flax, hemp, and silk. Soap was made from agriculture-derived fats and oils. Adhesives were made from starch, and animal glue. Shoes and suitcases were made almost wholly from leather. Paints were made from vegetable oils; alcohol, from molasses and corn.

The chemical and petroleum industries, through research, quickly developed new products from coal and petroleum. Synthetic fibers currently account for 35 percent of total fiber consumption; synthetic detergents now account for 60 percent of all soaps and detergents. Within the past 10 years, the use of inedible tallow and grease for soapmaking decreased from 42 percent to 20 percent of the annual supply of these fats. Between 1950 and 1955, the market for cattle hide leathers changed from one of scarcity to surplus.

Until about 20 years ago research in the industrial use of farm products received little emphasis. Now, with increasing farm product research, especially by the USDA research laboratories, new industrial uses for farm products have been developed; the trend of replacement of agriculture-derived products by petroleum and coal tar products has been decreased.

#### Many future prospects possible - new species

Of some quarter of a million species of higher plants, only a hundred are used by man. No comprehensive scientific effort has been made to determine the chemical, medical, and industrial values of plant species growing in the earth's wild areas. Most plant exploration has been directed toward the search for strains offering improvements in existing crops.

The possibilities for using exotic or uncultivated plants in American agriculture and industry are little known. Most of the economically important plants now cultivated were chosen by early primitive farmers. Modern methods of analysis and agricultural practices are now being used to develop new crops. Thus, up to 1962, the Northern Regional Research Laboratory\* alone had screened or examined some 3,400 samples of new oil-seed bearing plants.

#### Soybeans -- a success story

Soybeans are an outstanding example of success in introducing new species to the United States. Introduced from the Orient, soybeans were grown on only a million acres in 1930. Scientists successfully exploited the soybean's versatility for industrial use, as well as for food and feed. In 30 years, its usage has grown so that it accounts for 75 percent of the vegetable oils used in the manufacture of shortening, 85 percent of the vegetable oils used for making margarine, and 50 percent of our high-protein livestock and poultry feed.

In 1962, 675 million bushels of soybeans were harvested from 27.9 million acres and brought farmers about \$1.6 billion gross income. Besides satisfying many food, feed, and industrial needs, soybeans are a major export commodity. (U. S. output is more than double that of the next largest producer, mainland China.)

\* USDA's Agricultural Research Service



Research -- 3 percent for chemical industry  
1 percent for Agriculture

The chemical process industries as a whole now spend about 3 percent of their total sales income on research and development. Agriculture, despite a great need for utilization research,\* probably spent less than 1 percent of total agricultural sales for research.

More than half of all agricultural research funds comes from Federal and State Governments. The Department of Agriculture budgeted \$18 million for utilization research and development in 1961, plus about \$2 million allocated abroad (through foreign funds derived from sale of U. S. farm products under Public Law 480). These funds were used for food and feed research, as well as for developing industrial uses, with emphasis on expanding the use of surplus crops, vegetable oils, and animal fats.

Research pays off

A recent study of the Department's utilization research costs showed that, in 1956-60, \$25 worth of benefits were realized from every \$1 spent for research. Between 1940-60 the average benefit-cost ratio was 15 to 1. During the 1940-60 period, Congressional appropriations for utilization research and development totaled \$170 million, resulting in such commercial products as: Soybean meal as a major contribution to the modern livestock and poultry feed industry; special finishes for wash-wear cotton fabrics; a process for producing frozen concentrate citrus juices; pioneering in the field of dehydrofreezing and time-temperature studies of frozen fruits and vegetables; fruit powders, high moisture prunes and figs; dehydrated potatoes; improved flavor and stability of soybean oil, which has led to considerably expanded use of the oil for food; wheat wafers for fallout shelters; use of the antioxidant, ethoxyquin, as a preservative in 80 to 90 percent of the dehydrated alfalfa meal for animal feed in the United States; new and improved industrial products, such as epoxy plasticizers, from seed oils and fats; improved quality of oleic acid; use of stearic acid as a lubricant in rubber manufacture; use of tallow for tinning and cold rolling of steel; use of fats as animal feed; an improved fermentation process for producing penicillin; dextran, a blood plasma extender -- to mention just a few.

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\*Utilization research is the study of the physical, chemical and nutritional properties, and the modification of the products of agriculture -- for developing new, improved products for food, feed, and industrial uses.

## New crop studies

The Department of Agriculture each year analyzes 600 to 700 varieties of seed for oil content, protein value, and industrial value.

Some crops with potential commercial use are: Bamboo, for paper manufacture and as structural material; sesame, for many food, feed, and industrial uses; Jojoba Simmondsia, for oil and wax manufacture; Dioscoria, for cortisone production and other drugs and chemicals; guar, for use in the paper industry and for the stabilization of drilling muds; canaigre, for the tanning industry; and kenaf, for cordage fiber and as raw material in the paper industry.

## The castor bean

The castor bean is a good example of how research could increase the use of farm products and create new jobs and markets for industry. Castor beans yield an oil with unique and valuable properties now used in paints, varnish, fungicides, and cosmetics. The oil is converted into sebacic acid and capryl alcohol used in the manufacture of plasticizers, coating materials, resins, and lubricants for high-speed engines. However, the allergenic substances present in castor seed pomace present the major obstacle to the use of castor as an animal feed and thus its reaching the status of a major crop. Research is currently being carried out to solve this problem. Efforts are also being made to increase the industrial use of castor oil by developing new products, such as polyurethane foams and coatings.

## THE CHEMICAL INDUSTRY, A BIG CUSTOMER

In 1959, 12.8 billion pounds of agricultural raw materials, valued at \$1.5 billion, were used in the chemical and allied industries. Of this, 3 billion pounds of agricultural raw materials, worth \$785 million, were imported. Industry converts 60 million bushels of corn into starch each year for nonfood uses valued at \$120 million. Starch is used for paper-sizing, adhesives, oil-well drill-mud additives, building materials, and explosives. Nonfood industries used 1.5 billion pounds of seed oils in 1959, such as linseed oil, used for paints, varnishes, floor coverings, lubricants and greases (418 million pounds in 1959 with a sales value of \$65 million); and soybean oil used in the manufacture of paints, resins, and plasticizers for plastics (358 million pounds in 1959, worth \$35 million).

In 1961, more than 800 million pounds of fats were used in the manufacture of soap.

In 1961, 572 million pounds of fatty acids were produced from fats, tall oil, and vegetable oil. These materials were converted to chemical products used as paint driers, disinfectants, materials to refine ores, and lubricants in the rubber industry, to name just a few.



Approximately half of the glycerine we use, or about 165 million pounds, is produced annually from fats and oils. Glycerine is used to soften cellophane, manufacture alkyd paints, keep tobacco fresh, produce explosives, and in foods, beverages, drugs, and cosmetics.

The agricultural product wood is almost an untapped source of chemicals. Its use in tremendous quantities for paper pulp (34,000,000 tons of paper and paperboard were produced in 1959) is augmented by its use as a source of alpha-cellulose for the manufacture of plastics, and for newer products such as particle board for building purposes and thermal insulation products.

Tall oil, the production of which was 810 million pounds in 1959, is a waste product of the sulfate pulping of pine trees. It is a source of fatty acids used in making alkyd resins, paint driers, soaps and detergents, and hard floor coverings.

Dimer acid, produced from tall oil fatty acids, is used in the manufacture of alkyd paints and other surface coatings -- gel paints, polyurethane foams, and lubricants and lube additives.

Tall oil is also a source of rosin. Rosin is also produced from the southern pine tree, together with turpentine. Rosin is used as a paper size, in adhesives, in the manufacture of chemicals, paints, varnishes, and lacquers, oils and greases, printing inks, rubber, and soap. The total consumption of rosin in the United States was 733 million pounds in 1960. Approximately 130 million pounds of turpentine are used each year as a solvent for paints, varnishes and lacquers, in the manufacture of chemicals, oils and greases, shoe polish and rubber.

In 1960, 575 million pounds of starch and dextrin, 84 million pounds of soybean protein, 98 million pounds of animal glue, 55 million pounds of blood, 10 million pounds of casein, and 10 million pounds of rosin and its derivatives were consumed in adhesives.

Approximately 100 million pounds of furfural are produced from corncobs each year. Furfural is used as raw material for the manufacture of nylon, as a solvent in the petroleum industry, and as a raw material in making resins for surface coatings and binders.

Whereas a billion pounds of cotton linters were used in 1956 to make rayon, acetate, cellulose acetate, butyrate plastics, and nitrocellulose for lacquers, film, and explosives, only 300 million pounds were used in 1961. Mattress felts and beddings are consistently the largest outlets for linters, other than chemical products.

## SOME INDUSTRIAL USES

A list of all the ways in which farm products are used in industry would be infinite. Just one intermediate product, starch, finds its way into a myriad of products. These include: Adhesives, dry cell batteries, boiler compounds, fuel briquettes, ceramics, chemicals, cigarettes, cork products, cosmetics, dyes, explosives, castings, insecticides, insulation, laundry blueing, linoleum, lumber treatment, mining, paints, paper, plastics, plywood, printing ink, rayon, road paving, rubber, silvering compounds, soap, textiles, and window shades. Of the total U. S. production of approximately 5 billion pounds of starch, roughly 95 percent is produced by the corn wet-milling industry.

### For starch

Cornstarch's largest use is as a size to make paper strong and tough and in the machine coating of paper. The paper industry uses about a billion pounds of starch in the manufacture of paper and paperboard. Next largest use is in the textile industry. Approximately 300 million pounds of cornstarch are used annually in warp sizes for cotton and textile fibers.

Other nonfood uses of cornstarch are less well known, but many are important.

Pregelatinized starch is used as a core binder in foundry molds. Raw and processed starches are used in the mineral industries in the ore flotation process. Starch is an essential ingredient of many oil-well drilling muds.

Starch pastes are used as binders in many types of building materials. As a diluent and filler, starch is used in cosmetics, insect powders, and soap or cleaners. It is the basis for a variety of adhesives and binders and is even found in such products as charcoal briquettes and dynamite.

Nearly 200 million pounds of dextrin are produced from starch for use as an adhesive.

### For corn

Although the other products of corn refining are mostly consumed in food uses, they have industrial applications too.

Corn sirup is used in glassine paper, rayon making, and pharmaceuticals. Corn sugar finds some applications in the tanning and rayon industries. Lactic acid, a fermentation product from corn sugar, is used mostly for food products, but it is also used in leather tanning, textile printing, and the manufacture of synthetic resins. Small amounts of corn oil are used in soap and insecticide manufacturing. Even the steepwater from corn refining has become important in the pharmaceutical industry as a culture medium for penicillin production, among other processes.



Another byproduct of corn refining is zein, a versatile protein material. It can be used in lacquers, plastics, printing inks, abrasive binders, and laminating glue.

#### Fats and oils

We usually think of fats and oils as foods. Few of us are aware that 925 million pounds of fats and oils were used in soap manufacture in 1959, 913 million pounds in drying-oil products, 779 million pounds in paint and varnish, 55 million pounds in floor coverings and oilcloth, 97 million pounds in lubricants and greases, and 1.1 billion pounds in other inedible industrial products.

Polyvinyl chloride, a plastic used for furniture covering, flooring material, and raincoats, must be softened with a plasticizer for most of its uses. Agriculture supplied 45 million pounds of epoxidized oils that went into plastics (principally polyvinyl chloride) in 1960 for use as a plasticizer. About 1.5 billion pounds of vegetable oil go into industrial uses each year. Coconut, linseed, soybean, castor, and cottonseed oils are the principal ones.

Two million pounds of animal-fat-derived vinyl stearate, a development of USDA research, is used as a plasticizer (technically known as an internal-type) in plastics each year. USDA scientists expect an annual market for about 100 million pounds of this type of product eventually.

#### 100 million extra bushels may be used in 1975

Each year, some 40 million bushels of grain go into such products as surface-active agents, antioxidants, polymers, plasticizers, packaging films, and chemicals for metallurgic processing. Similar chemical products now being developed by USDA offer potential outlets for another 100 million bushels a year by 1975.

An example is the growth of the plastics industry. Today's total annual production of plastic, about 6.7 billion pounds, may well reach 10 billion pounds by 1965 -- to supply demands for such products as packaging and industrial films, molded and extruded products, plastic foams, containers, and paints.

Agricultural raw materials could be used for making many plastic products, if inexpensive processes and products could be found. The vegetable oils and animal fats, starches and proteins are good starting materials for plastics production. Utilization research aims to place farm-grown materials into as much of this expanding multi-billion-dollar market as possible.

## THE FEED INDUSTRY, \$5 BILLION

In 1960, farmers purchased \$4.8 billion worth of feed for livestock, 18 percent of their total farm production expenses. Farmers themselves grow much of the raw materials used in feed. But, the feed industry can be considered another industrial market for farmers' production.

The commercial feed industry sold about 40 million tons of feed ration in 1960, compared with about 10 million 30 years ago. It employs almost 60,000 workers, three times more than 25 years ago. Total payroll increased from \$24 million a year to \$250 million a year in the same 25 year period. Heavy machinery, which has become much more important in recent years, has brought about a tendency to concentrate the industry in fewer establishments. Still, about 2,400 commercial firms were reported in 1958.

Feed continues to be the major supply product handled by farmer cooperatives. The net value of \$886 million accounted for almost 37 percent of all farm supplies handled by cooperatives in 1959-60.

In 1960, farmers purchased \$538 million worth of seed. American farmers grew most of this seed, but a large part of it moved through commercial processing plants and channels to other farmers.

Farmers in 1959-60 bought over \$100 million worth of seed - a fifth of their requirements - through their cooperatives.

## THE FUTURE FOR INDUSTRIAL USES

### Soaring production provides new markets

Since 1947, chemical and allied production has grown at an annual rate of 8 percent, compared with 4 percent for total industrial production. The 1960 sales of \$27 billion were double 1947 sales.

From 1938 to 1958, production multiplied considerably: Plastics, 130-fold to 4.5 billion pounds; synthetic rubber 5-fold to 2.2 billion pounds; synthetic detergents, 15-fold to 1.3 billion; synthetic fibers, from none to 490 million; agricultural chemicals (mainly pesticides and herbicides) 8-fold to 540 million; medicinals, 13-fold to 101 million pounds. A paradox is that these new materials have partly displaced the traditional farm commodities (cotton, animal fats, and vegetable oils) but at the same time have provided a market for many of them, as well as other farm products. The chemical industry is expected to grow at a rate of about 5 percent a year in the 1960's. This is the challenge of utilization research -- to find new uses for present and future farm materials to supply the needs of new and expanding markets.



New products from USDA research that may be on the threshold of wide commercial acceptance are -- water-dispersible linseed oil paints for easy application, fast drying, and rapid cleanup painting; dialdehyde starch for use in tanning leather and wet-strength paper manufacture; polyurethane foams from agricultural products as insulation materials for homes and commercial buildings; cereal products for use in paper manufacture; alpha sulfoacids of tallow for use as detergents; new seed oils for use as plasticizers for plastics and surface coatings; polysaccharide gums for viscosity control in industrial applications.

#### Fermentation -- key to expanded use?

A method of increasing interest to industrial scientists in recent years involves the use of microorganisma. While the organisms feed on a nutritive medium at or near room temperature, they produce new organic chemical products. Today, fermentation processes are the prime source of nearly 100 products used in the food, chemical, and pharmaceutical industries. Originally fermentation was used to produce solvents, acids, and sugars. Now microorganisms are also used to produce enzymes, steroids, plant and animal growth factors, antibiotics, complex organic chemicals, as well as chemical products of relatively simple structure. Fermentation processes offer a considerable potential for the use of agricultural raw materials. As a result of USDA fermentation research, processes have been developed for producing penicillin, citric acid, dextran, and several other polysaccharides for use as viscosity control agents, beta-carotene, 2-ketogluconic acid, gluconic acid, and microbial insecticides -- to cite just a few examples.

The USDA Northern Research Laboratory at Peoria, Ill., houses 9,000 different microorganisms for screening in fermentation research.

#### Potential for increased use

From the chemical industry viewpoint, the future holds tremendous potential for using more agricultural raw materials. Most segments of the industry believe that ease of availability, comparatively low cost, and the distinctive complex molecular structure of many agricultural raw materials, which are obtainable in synthetics only at high cost or not at all, will lead to increased industrial use of many agricultural materials. Examples of these complex, difficult-to-synthesize materials, are wood cellulose, sugars, starches, and proteins.

#### Agricultural materials renewable

As fossil resources (coal and petroleum) are further depleted, industry is expected to turn more and more to the renewable resources, agricultural raw materials. The trend in past decades has been away from agricultural raw materials rather than toward them. The forces responsible for this trend are still active. Agricultural products can be used only in those processes where their properties and costs make them the best suited raw materials.

## *Jobs and Workers*

Farm work differs from industrial work, but the difference is not technological backwardness. Most farm workers today use more power and complex machines than do factory employees. However, there are three basic differences:

First, in farm work, man deals with nature - the hours of labor and the sequence of operations are dictated by weather and by the life cycles of plants and animals.

Second, most farm workers are farm operators and their family members.

Finally, there is the matter of pay. The average farm worker earns far less for his work than does the average industrial production worker -- \$1.05 an hour compared with \$2.39 in 1962.

### FARM EMPLOYMENT DOWN

Farm employment dropped to 6.8 million in 1962; 5 million farm family workers, and 1.8 million hired workers.

About 5.5 million workers receive most of their income from farmwork. The others of the 6.8 million receive most of their income elsewhere. A still better measure of reduced farm employment is man-hours of labor used for farmwork. Almost 9.3 billion man-hours were used in 1962, about half of the total man-hours used just after World War II.

In 1890 the number of industrial workers equaled the number of farm workers in the United States. By 1910, only 3 American workers in 10 were on the farm. Each farm worker supplied 7 other people. Our farmers were among the most productive in the world, and the United States had become the world's leading agricultural producer.

But progress had just begun. Better plants (through genetics) and scientific farming principles received great attention. The gasoline engine substituted machines for muscles.

During recent years, agricultural technology has grown faster than industrial technology. From 1950 to 1960, gain in output per farm worker almost doubled the gain in manufacturing; 5.1 percent a year compared with 2.7 percent. By 1962 each of our farm workers supplied farm products to 27 consumers.



## WORKER EFFICIENCY GAINS

Four million fewer farm workers produced over 50 percent more in 1960 than in 1940. Some of the most significant changes realized during the 20 years before 1961 are:

Corn -- 118 percent more corn per acre -- produced with 71 percent fewer man-hours per acre; 88 percent less work per bushel.

Wheat -- 56 percent more wheat per acre, and 67 percent fewer man-hours per acre; 76 percent less work per bushel.

Cotton -- 77 percent more cotton per acre, and 52 percent fewer man-hours per acre; 72 percent less work per bale.

Milk Cows -- 56 percent more milk per cow, and 35 percent less labor per cow; 58 percent less work per gallon.

Broilers -- 89 percent less labor per pound.

Sweeping changes in the number and kind of farm workers have occurred as their efficiency rocketed up. The great reduction in farm workers has been partly offset by more jobs in industries and other businesses servicing farms. The additional jobs have prevented greater rural unemployment.

The cost-price squeeze -- lower prices for farm products coupled with higher prices for labor and production tools -- meant that farmers had to adopt more efficient farming methods and machines. The new methods and machines increased labor productivity even faster.

The average farm used less than a half year's work by hired labor in 1959, the same as 20 years earlier, when there were almost 3 million more farms. Farm employment declined by 3.6 million workers as acreage per farm increased from 174 to 302. Half of our 3.7 million farms reported hiring no labor in 1959.

As farm output per man-hour almost tripled in 20 years, the family farm, with the operator and his family providing most of the labor and management, continued -- actually made gains -- as the major production unit in agriculture. Total farm production from family farms was 74 percent of all production in 1954, compared with 67 percent in 1949.

## CUSTOM WORKERS

Hired custom service expanded during this period. Farmers were thus able to use specialized, expensive workers and equipment for spraying, dusting, and fertilizing crops, for mixing livestock and poultry feed, and for other specialized jobs.

The widespread use of custom work is apparent.

-- About 5,000 aircraft are now employed for applying chemicals and seeds on farms and ranches. About 40 percent of all commercial flying in the U. S. is agricultural.

-- Some 50,000 custom workers take part in the annual wheat harvest.

-- The volume of feed grains commercially processed into animal rations has more than tripled since 1939.

Custom work is ordinarily considered self-employment rather than farm wage work. Statistics are spotty, but a 1957 survey provided the first study of custom work as distinguished from farm wage work. Nine-tenths of the 368,000 persons engaged in custom work reported having done hired work only in combination with machinery. Of these custom workers, fewer than 100,000 spent more than 25 days a year working on farms; their wage rates averaged about \$20 per day (for man and machine). Custom workers employed for shorter periods averaged about \$31 a day.

The 5-year Census of Agriculture provides custom work information only in regard to "expenditure for machine hire," which increased from \$114 per farm in 1949 to \$217 in 1959, while the total machine-hire expenditures increased from about \$600 million to about \$800 million.

#### HIRED FARM WORKERS

The size of the hired farm working force has varied from 3 million to 4.3 million individual workers since 1945. It reached the peak in 1950 and has been at least 3.5 million individuals since 1956.

Only 438,000 workers,\*nearly all males, were employed 250 days or more at farm wage work in 1960. These were generally skilled and experienced workers. Imported seasonal workers offer them little competition. The year-round male workers' earnings have doubled since the late 1940's, while earnings of all male hired workers have risen about 40 percent. Higher living costs have erased about 30 percent of these increases. Female hired workers, one-fourth of the total work force, had no increase in real earnings.

Male workers in the hired farm working force of 1959 averaged \$7.70 earnings per day, if they worked mainly with machines and less than \$6 per day, if they did only hand labor. The turnover rate among male workers is high, about 20 percent each year. About 15 percent of all male workers had 20 years' or more of experience.

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\* 404,000 in 1961



While 1.9 million farms hired some labor in 1959, most farm wage workers were employed on specialized farms producing vegetables, fruit, cotton, or sugar. There were 205,000 farm operators who employed migratory workers; about 74,000 operators hired migratory workers exclusively.

The average cash wage bill for the 1.9 million farms hiring workers in 1959 was about \$1,300 per farm, but about 2.5 percent of all farm employers paid \$10,000 or more in cash wages that year.

Recent rises in farm productivity have been made with the use of less total labor, but this work has been spread over a hired working force of about the same size. (See Education and Level of Living page 10.)

In 1959, for example, all hired farm workers worked the equivalent of only 1.2 million job-years. But about 4 million people were employed for farm work at some time during the year.

Many hired workers are severely handicapped in the labor market by lack of skills, education, and training. Unless the Nation's general economic health is very good, their opportunities for better paying work are limited.

About 6 out of 10 persons hired to work on U. S. farms in 1960 had completed less than 8 grades of school; only about 1 in 7 had completed high school. Male heads of households who had completed at least 1 year of high school earned twice as much a day at farm work as those who had completed only 4 years of school. The better educated workers also had steadier employment, earned higher annual wages, and more often worked at nonfarm jobs than did those with little education.

In the South, hired farm workers had completed an average of 7 years of school compared with an average of almost 9 years completed by workers outside the South. Average educational level of farm laborers has not improved over the past 20 years.

### STANDARDS OF EFFICIENCY

American farm efficiency enables 92 percent of our workers to choose nonfarm occupations with relative freedom. This fact is better appreciated in countries where farmers' inefficiency hampers industrial development. Accustomed to viewing the assembly line as the active symbol of productivity, many city people do not comprehend what their farming neighbors are doing.

The facts of nature and plant life preclude a farm with hundreds of workers reporting daily to carry on activities comparable with the factory assembly line.

Farms that do approach this factory concept have been developed, however, in the mild climates of California, Florida, Arizona, and Southern Texas. These States are major centers of hired farm workers.

Efficient farm production requires attention to weather and soil conditions and decisions on timing operations -- and generally these cannot be directed satisfactorily from a swivel chair.

Machines, however, have brought great increases in the area of land a man can handle. A man with a good team of horses would plow about 2 acres a day. Mechanical power makes it possible for him to plow 10 to 100 times that much. Power has also been applied to other farm work with similar increases in efficiency. Savings in cost per unit of output are generally achieved within the limits of family-size farms. Only negligible additional savings may be obtained with larger-than-family-size farms.

There are significant economies in farm size-up to the point where a full line of equipment can be used. This point is well within the size limits of family farms. Beyond it, there is little additional economy in size. Expanding farms beyond family size merely multiplies the same units already used on well-organized family farms. (See The Family Farm, page 28.)

#### PROBLEMS EFFICIENCY CREATES

Increasing productivity per worker has pushed people out of farming. Uprooted by technological progress, many find it difficult to get other employment. The trend continues toward fewer farms, fewer farmers, and fewer hired workers. A principal reason: Only one-fourth of American farms can obtain necessary capital and resources -- primarily machines and land -- for efficient production. About 1.6 million family farms lack the resources needed to earn \$2,500 a year, the minimum for a reasonable standard of living.

The great increase in farming expenses and farm land prices, with continuing low farm wages, make it increasingly difficult for farm workers and tenants to buy an adequate size farm.

#### LADDER CONCEPT NO LONGER VALID

The traditional concept of the "agricultural ladder", by which a farm youth climbs to own and operate a farm has included most of these steps: (1) Farming experience on his parents' farm; (2) Working on a neighbor's farm to get more experience and enough capital to be a tenant; (3) Operating a rented farm to earn a downpayment on a farm; (4) Buying a mortgaged farm; and (5) Eventually paying off the mortgage.



In 1880, the Census revealed 1 in 4 farm operators was a tenant. The proportion of tenants and sharecropper farmers increased until 1935. The proportion of farm laborers increased until 1940. Since 1935-40, the proportion of tenant farms has dropped to 1 in 5, that of sharecropper farms to 1 in 30.

Seventy-nine percent of farm operators owned part or all of their farms in 1959, compared with 57 percent in 1930, and the recorded peak of 74 percent in 1880. Better farm credit helped many farmers improve their status. In 1959, however, there were 800,000 farm operators renting land, in addition to that they owned. The need for larger acreage, to make efficient use of expensive farm machinery, creates a strong demand for farmland. Added cropland speeded the decline in numbers of farm workers and farms, by making possible more use of larger, expensive equipment.

As farm job opportunities decline, a farm labor surplus is created. As the number of farms decline, and capital requirements increase, the traditional agriculture "ladder" is displaced. Keen competition for available lands, low wages, and low net profits make farm ownership extremely difficult for the young farm worker.

Inheritance and family help are alternatives to the traditional self-help ladder. Neither will usually permit all the children of farm parents -- owners, tenants, croppers, or hired laborers -- to achieve farm ownership. About 80 percent of the farm reared youth must find jobs outside commercial farming. But there are opportunities for youth in agriculture that are not being fully realized.

#### UNFILLED AGRICULTURAL JOBS

A large number of professional, scientific, managerial, and technical jobs are available in the expanding agricultural economy. Records of the American Association of Land-Grant Colleges and Universities show 15,000 college graduates are needed each year for positions in these fields. The colleges supplied only 7,000 graduates in 1960.

Important changes in the farm labor force are expected to continue. Many farm youth will be needed for agricultural research, education, and technology.

Individual requirements will call for greater training capital and skill for successful farm operation; fewer, but more experienced and skilled, full-time hired farm workers; custom workers for a wide variety of services; and -- until new machines are developed to relieve man of more tedious work -- a migratory labor force for such highly specialized crops as vegetables, fruits, sugarbeets, sugarcane, and cotton.

## CHAPTER IV

# MARKETING AND CONSUMER PROTECTION

## *From Farmer to Consumer*

One important reason for the striking increases in output per farm worker is that many jobs once done on the farm have moved to the city. This is true especially of farm power and marketing.

In a sense, marketing is a continuation of the production job that starts on the farm. To be useful to the consumer, a product must be in the right form, at the right place, at the right time. That's the job of processing, packaging, handling and storing, transporting, and selling--all the jobs that add up to agricultural marketing.

Our marketing system influences farm production in many ways. Because of marketing, we grow many of our products in specialized areas where they can be grown most efficiently--perhaps hundreds or thousands of miles from market. It lets us, wherever we are, enjoy foods no matter where they are best grown.

What did it take to create such a marvelous nationwide system for using our abundance?

It took market information....information on production, on supplies actually reaching various markets and prices in those markets, on demand now and expected later....fast-moving information for perishable products.

It took development and use of a common language--standards of identity, standards of quantity, standards of quality.

It took rules of fair play and an impartial umpire to see that they were carried out.



Later, it took a variety of Government actions to help attain orderly marketing, at least moderately fair returns to producers, care of our resources, and constructive use of our abundance.

And, finally, it took a scientific approach to the problems of marketing, transportation, and distribution of agricultural products similar to the scientific methods which have been utilized so successfully...in connection with the production of agricultural products, so that such products capable of being produced in abundance may be marketed in an orderly manner and efficiently distributed.

Congress in 1946, declared its intent to provide for (1) continuous research to improve the handling, storage, processing, and transportation of agricultural products; (2) cooperation among Federal and State agencies, producers, industry organizations, and others in the development and use of research and marketing programs to improve distribution; (3) an integrated administration of all laws enacted by Congress to aid the distribution of agricultural products through research, services, and regulatory activities.

#### WHAT MARKETING IS

Marketing begins on the farm and ends with the consumer or final user.

Between farmer and consumer, there are weekly paychecks for 10 million people--the men and women who transport, process, finance, stock, sell, and deliver the foods, the fibers, and the industrial products created from farm materials.

The roads to market are many and varied. Three quarters of farm production is needed to feed 186 million Americans. The balance is for industrial and export use.

Marketings of farm goods reached a record high in 1961 even though production was unchanged from 1960. Movements from stocks made the difference. Wheat and feed grain inventories were reduced.

The marketing process raises value of farm goods about three times the farm price. Farm goods account for less than 10 percent of our gross national product, at the farm. After they leave the farmers' hands, food, fiber, and tobacco are multiplied in value as they go through plants and markets and along countless roads and waterways--to become the food and clothing, chemicals, tobacco and beverages, homes and furniture that raise our living standard and advance national goals.

In their final forms, the inexpensive and plentiful products of the fields, pastures, range, and woodlands account for 40 percent of the Nation's total economic activity.

It would be simple to market the products of a single farm if the customer was only a single family. Of course, these two hypothetical families, the farmer's and his neighbor's, would be accustomed to a rude diet, an occasional hungry year, and to spending most of their time in raising and preparing the bare necessities of life. Pioneer Americans knew such conditions. Most of the world's peoples know little better even today.

Modern America, however, is accustomed to fantastic efficiency in farming--a single farm worker among each 27 citizens. We tend to take for granted a system of production and distribution that would have seemed a miracle here in earlier times--and seems so even today in many other lands.

Production without purpose, harvests without markets, would be our lot if the roots of the marketing process did not reach far inside the farm fence. Market information, demands and prices, are a daily, seasonal, and annual concern to the Nation's 3.7 million farmers. Yet, each farmer alone is unable to gear his production power to the market.

To understand how marketing methods have changed to meet conditions, some historical perspective is helpful.

Not until about 1900 did American farmers begin to appreciate fully the value of marketing. Before that year, farmers knew little about the sales end of their business. They grew the crops; selling took care of itself in the "natural course of things."

Returns through "the natural course of things" had become, too often, a source of concern and dissatisfaction for the farmer. At the other end of the process, consumers, too, were concerned and dissatisfied with quality, supply, and price.

This common interest brought Congressional authorization in 1913 for an Office of Markets, to provide farmers with research and educational help on their cooperative and marketing problems. By 1915, daily reports on the movements and prices of perishable products were begun. Farmers and distributors liked the service, found it helpful, and urged its extension to other products. As market information became more generally available, farm supplies began to flow with greater regularity to meet demands. National market information and improved transportation opened new outlets for highly productive farming areas. Consumers and farming communities benefited. Accurate and unbiased information facilitated prompt, wide-spread, and more efficient distribution of farm goods.



It did not, however, solve the problem of gearing production to demands. Something of the depth and the serious character of this problem is apparent in the 1920 Report of the Secretary of Agriculture.

Secretary E. T. Meredith informed the President:

"The farmers of America have again justified the faith of the Nation in their ability to meet its requirements of food, feed, and raw materials for clothing. They have produced this year...the largest harvest in the history of American agriculture, with a single exception...."

"After the farmers had completed their planting and harvesting operations... they found themselves face to face with a falling market. As a result, a situation has been brought about which may have serious consequences...to our agriculture and to the Nation.

"During all the months when the farmers were cultivating their crops, paying for labor and supplies at unusually high rates, the prices of agricultural commodities generally remained high. In midsummer...their income period was about to begin...a sharp decline occurred in the prices of practically all farm products...."

"The year's (crop) output, produced at an abnormally high cost, is worth, at current prices, \$3 billion less than the smaller crop of 1919...the total value of animal products in 1920 is...about \$200 million less than in 1919. There is probably no other industry or business that could suffer a similar experience and avoid insolvency."

Secretary Meredith observed that crop prices before planting were 22 percent higher than they had been a year earlier. Prices were stable for 5 months, then broke sharply during July. By November 1 they were 28 percent lower than on the same date in 1919. He warned:

"A sober national thought with regard to the importance...of a sustained agriculture in this country is imperative. There is, perhaps, no single solution for the situation which the farmers are now facing, but there are many steps which can and should be taken to place our agriculture on a more satisfactory basis and to stabilize the business of farming, not in the interest of the farmers alone but in the interest of the Nation as a whole. The matter is of such tremendous importance to our entire population that it should be recognized everywhere as a national problem and dealt with as such. "

He suggested that ways be found to carry over good crops to the lean years, and that attention be given to marketing and the development of outlets.

He noted that many charges of wheat price manipulation were being investigated. He cited the need for: Marketing research and cost studies, here and abroad; funds to enforce existing authorization to supervise live-stock markets; adequate short-time personal credit for farmers; studies for development of better ways to rent and buy farms. He expressed concern for soil depletion.

### MARKETING IMPROVEMENTS

Vast improvements have been realized. But markets and conditions continue to change. Farmers, processors, distributors, and consumers change--in what they can do and what they want, in their methods and efficiency, in their likes and dislikes.

Today, farmers' retail markets and roadside stands and the huckster who markets farm produce door to door have a minor place. The farmer usually sells to a local buyer or through a cooperative, seldom to the consumer. He has greater protection in the market place and easier access to distant markets. He still needs to better adjust his production to meet changing demands.

### New York, \$10 million saving possible

It has been said that it costs less to move a crate of lettuce from California to the east coast than across the Hudson River to the New York wholesale market. One example of the need for improved city market facilities is the New York City fruit and vegetable market in lower Manhattan. Fourteen million metropolitan New Yorkers spend \$500 million a year for fruit and vegetables, equal to 165,500 carlots. Of this amount, the equivalent of 111,000 carlots move through the congested lower Manhattan area. About \$10 million, or 2 cents per dollar of produce, is unnecessary, caused by a wasteful, inefficient marketing system in the city.

Efficiently produced food arrives in the New York terminal market to find a great amount of inefficiency. No train reaches the Washington Street market, the principal wholesaling center. Produce arriving by rail must be transferred to trucks to reach the market.

Big cross country trucks are barred from the market. Produce must be transferred to smaller trucks. Cartage, from point of arrival to the market, adds an estimated \$4 million a year to the city's fruit and vegetable bill.

Trucks wait in line for hours to unload or pick up produce. These delays cost nearly \$3 million a year in time of men and trucks. Loss of quality and outright spoilage caused by delays and excess handling cost nearly \$2 million a year.



Because of the extreme congestion, tons of produce must be carried on men's backs to waiting trucks, parked some distance away. Portage charges add \$1 million to the city's annual produce bill.

Construction began in late 1962 on a new terminal market for fruits and vegetables. This is expected to reduce marketing costs, improve service and reduce labor requirements.

Terminal wholesale markets in many cities, especially fruit and vegetable markets, are antiquated, congested and inefficient. The problem is complicated because new products are being handled, marketing methods are changing, and the whole marketing structure is very different from what it was only 10 years ago. In Detroit, it is estimated that if a new food distribution center were built at a more suitable location, \$4 million in savings would result. Plans are being developed for new terminal market centers in Boston, New Orleans, Detroit, San Francisco and San Juan.

New terminal markets have been built in many cities--Philadelphia, Hartford, Baltimore, Columbus, Raleigh, Atlanta, Birmingham, San Antonio and Houston, to name a few.

Plans have been developed for a new wholesale food market in Pittsburgh. It would cost about \$35 million to build and could bring net savings in food handling costs of about \$2 million a year.

#### MARKETING RESEARCH

Marketing researchers work closely with industry, using the system's packingsheds and warehouses, its storages and transportation facilities, its wholesaling and retailing outlets, as a vast research laboratory. Some of the results of this vast, continuing effort include:

1. Wholesalers of fresh fruits and vegetables can reduce their costs of receiving produce by up to 60 percent--by adopting improved practices. A change from use of two-wheel hand trucks to more efficient methods can cut the costs for labor and equipment from \$1.39 to 54 cents a ton.
2. An air-door has been designed that keeps heat out of cold storage rooms while produce is being moved through open doorways. It cuts down the danger of collision in the doorway, allows free movement of workers and equipment, and acts as an insulating curtain.

3. Designs for a new wholesale market in one city (New York) showed possible yearly savings of some \$25 million. Several similar markets have already been built in other cities; others are being planned.
4. Managers of terminal stockyards can save up to 30 percent of the costs of cleaning cattle pens by carefully selecting the most suitable equipment and methods.
5. Equipment that will shell a 500-gram sample of farmers stock peanuts in 3 minutes or less has been developed.
6. Shipping lettuce at the "firm" stage of maturity, and trimming it to two wrapper leaves, substantially reduces shipping weight while maintaining quality for the consumer.
7. By handling oranges in pallet boxes (instead of 2-bushel field boxes) and using forklift-equipped tractors in the grove and forklift trucks at the packinghouse, a handler of an annual volume of 200,000 field boxes can save an estimated \$9,640 annually.
8. Beef, shipped in refrigerated railroad cars and trailers can be kept at more uniform temperatures by distributing cold air around the load than by blasting it through the load.

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# *The Marketing Spread*

## FOOD TAKES A WALK

Food takes a long walk from field to table, and each step adds to the cost. In fact, of each farm food dollar spent in 1961, 62 cents was for marketing, and 38 cents for the farmer. \*

There was a time when most food came from farms near town -- when locally produced potatoes, cabbage and turnips were the family's main vegetable diet through the winter months ... when many farmers delivered milk and produce to consumers ... when the women of the family baked their own bread and cakes ... when most food we ate came from the same county, almost entirely from the same State.

Today, our food comes to us via rail, water, highway, and air. Refrigerated railway cars carry fruits, vegetables and other perishables 3,000 miles, delivering them fresh and tasty, year 'round. Glass-lined truck tankers transport milk many hundreds of miles overnight. We eat food produced in 50 States and more than 35 foreign countries.

A supermarket may have 8,000 different food items on its shelves. Convenience foods at the corner grocery, "ready mixes," "instant" potatoes, and milk, "heat and serve" dishes and meals provide built-in maid service for working or rushed homemakers. "Season" is year 'round for practically every food -- the result of the technological explosion in agriculture and in the marketing, processing, storing, transporting, wholesaling, and retailing of food.

Modern food production and marketing gives us a basic foundation for good health, longer life, and taller, healthier children. But supplying this nutritious, wholesome food in adequate amounts for a balanced diet is a big job -- and a big business.

In 1961, domestic farm food products for our civilian population cost \$62 billion. The farm value of these foodstuffs was \$21 billion. The marketing bill totaled \$41 billion.

The story of the food we eat is an involved one. It does not, of course, stop with the purchase and serving of food in homes. Today about one out of every four meals is eaten outside the home. An estimated 50 million people "eat out" every day in commercial restaurants and cafeterias, hospitals, schools, various types of State institutions, military installations, factories, retirement hotels, and homes for the aged.

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\* And in 1962.

Foods purchased for commercial and institutional kitchens in 1961 had an estimated \$7.5 billion wholesale value; value when served at retail price was estimated at \$18 billion by the National Restaurant Association.

### MARKETING COSTS AND MARKETING SERVICES

Marketing is everything that happens to food and fiber after it is sold by farmers -- the processing and distributing necessary to get products to consumers when, where, and how they want them.

Marketing costs are the payments or charges for these services -- the costs of labor, transportation, containers, supplies, taxes, and profits.

For consumers marketing costs add to the price of food. Shoppers pay, on the average, 62 cents of their farm food dollar for marketing costs. For many farm foods, the cost amounts to 75 or 85 cents.

High marketing costs may squeeze the shopper's food dollar so she has to buy less food -- or, less of the food she really prefers.

For marketing agencies higher wages, higher costs of supplies and utilities, and higher taxes may result in lower profits or perhaps no profits at all.

For farmers higher marketing costs may cut the farm price so deeply that the farmer cannot meet production costs. Unfortunately, production costs usually rise when the costs of marketing climb.

Thus, it seems, no one likes marketing costs -- neither the farmer, the consumer, nor the marketing agency.

### Costs pay for services

But let's take another look at the situation. Marketing costs also pay for services that add value to food. When these services are wanted by consumers, and when they can be provided efficiently, consumers will pay the marketing costs.

Some marketing is necessary to get farm products to retail stores, the way the customer wants them. Transportation is the first requirement; processing often is another. Many other services, such as canning, freezing and refrigeration help extend farm markets both geographically and seasonally.



These services cost money. They may add to the retail price. But, they make foods more attractive to consumers and reduce homemaker's time and costs in kitchen preparation. Likewise, higher wages to workers may add to costs, but they also attract more efficient workers. Greater efficiency may offset part or all of the increased wage cost.

More efficient processing and distribution may mean more services and less of a rise in marketing costs. This marketing efficiency is more evident now than ever before. Public and private research can continue this trend toward marketing efficiency.

#### Why food costs more

Just about everything costs more dollars these days. The yearly retail cost of farm food, for the average urban U. S. family, rose from \$940 in 1947-49 to about \$1,060 in 1961, about 13 percent. But, farm value (per family) of this food dropped from \$466 in 1947-49 to about \$400 in 1961, a 13 percent decrease.

The national cost of marketing farm food has almost doubled in 10 years, going from \$22 billion in 1947-49 to \$39 billion in 1959. Farm value went from \$18 billion to \$20 billion in this same 10 year period.

In 1939, the total marketing bill of \$8.6 billion was comprised of \$4.2 billion for labor, \$1 billion for transportation, \$0.3 billion for profits, and \$3.1 billion for other expenses.

Of the \$41 billion bill for food marketing in 1961, almost half (\$19 billion) was for labor, \$4 billion for rail and truck transportation, \$2 billion for corporation profits, and \$16 billion for other costs (including fuel, electric power, packaging, air and water transport, interest on borrowed capital, taxes, and noncorporate profits).

#### Unit costs show real increase

While hourly earnings in food marketing rose 300 percent from 1939 to 1961, unit labor cost went up only 154 percent, because production per worker increased at the same time. In fact, per unit labor costs have remained relatively stable in the past 3 years, in spite of continuing increases in hourly earnings. While unit marketing charges rose 39 percent since 1947-49, unit labor costs went up only 30 percent, in spite of an 83 percent increase in hourly earnings.

Corporate profits have risen less than hourly earnings. Corporate profits before taxes rose 226 percent from 1939 to 1961; corporate profits after taxes rose 96 percent.

Prices of containers, packaging, and most other marketing supplies are higher. Freight rates, interest rates, taxes, and other costs are also up.

Transfer of some of the food preparation work from the kitchen to the factory or restaurant has increased our farm food marketing bill by \$7.5 billion since 1940.

### Convenience and containers

Gone are the days when the housewife went to the live chicken market to pick out a bird, then take it home for plucking and evisceration. Gone are the days of washing sand out of spinach, taking the pail down to the milk store, waiting for the grocer to measure out the potatoes and apples from a barrel. No longer is the shoppers' choice of breakfast cereal limited to such few items as oatmeal, farina and cornflakes. Today, the choice is among hundreds of cereal products.

Foods that we accept as commonplace today were almost unknown a generation ago - vegetable shortenings, bake and serve dishes, heat and serve meals, new flavorings, seasonings, candies, salad dressings, canned shelled nuts, flavored popcorn, fried onion rings, powdered potatoes. Some of them add to the cost of our food budget.

### EATING HABITS CHANGE

The average American's eating habits change with increased income and the passage of time.

In 1961, compared with 1947-49, he ate 15 percent less wheat products, 28 percent less fresh fruit, 9 percent less potatoes, 19 percent less milk fat solids, 16 percent fewer eggs, 39 percent less veal, and 8 percent less pork.

He ate 32 percent more beef; twice as much ready-to-cook chicken; 24 percent more cheese; 22 percent more canned fruit; almost 300 percent more frozen fruit, and more than 300 percent more frozen vegetables.

During the same period, population increased by 17 percent.

Keeping pace with changes in eating habits and population increase could be difficult. Farmers more than met the demands. Farm production climbed 30 percent and its composition changed materially.



### Higher quality foods

Old line products have been improved. Vitamins are added to milk, margarine, bread, and fruit juices. Processed foods are more nutritious. Strawberries, peaches, and other fruits and vegetables are available year 'round, both fresh and frozen, and they are of higher quality than before.

### Out of the kitchen, into the restaurant

We spent 20 to 25 percent of our food dollars for meals eaten away from home in recent years. This upward trend has apparently continued for some years and is an important way in which our food habits are changing. Food eaten away from home (lunches for Dad, ice cream for the children, snacks for the teenagers, and more families eating in restaurants) contribute to our changing way of life and changing food costs.

### Food stores sell nonfood

When we buy groceries in a modern supermarket, we usually buy many non-food items. Soaps, detergents, paper products, cigarettes, hardware, plastic accessories, and phonograph records are among the many items carried home with the weekly groceries and charged to food in the family budget. A study by home economists at Purdue University showed that nonfoods made up about 20 percent of the supermarket purchases in Lafayette and Indianapolis, Ind.

### EFFICIENCY AND BUSINESS

Two thirds of the tremendous increase in agricultural production efficiency, in contrast with nonagricultural efficiency increases, was brought about mainly by increases in yield -- more milk per cow, more crops per acre, more poultry per pound of feed -- as well as the efficiency brought about by mechanization and bigger farms.

In the past 15 years, production per man steadily increased, both in the cities and on the farms. But while food marketing productivity went up between 2 and 3 percent a year, farm productivity rose at the rate of 5.1 percent a year. Productivity of all nonagricultural workers rose about 2.4 percent. This is due partly to the fact that some farm jobs have been moved to the city; e.g., farmers buy city-produced gasoline instead of growing hay and oats for horses.

No measures of wages and profits are available for all industry. Hourly earnings in food manufacturing plants averaged 12 percent lower than in all manufacturing plants in 1961. Hourly earnings in retail food stores were five percent higher than in all retail trade. Profit ratios are available only for manufacturing. In 1961, profits per dollar of sales were considerably lower in the food and kindred products than the average for all manufacturing industries, but profits as a percentage of net worth were a little higher in the food and kindred products industry than in all manufacturing.

#### Who pays the bill?

Almost all food that was prepared in the home a generation ago can now be bought readymade in the store. New, improved foods can also be bought. Foods in new forms, and new ways of preparing food, have helped the farmer with new markets. But the consumer has to pay for these additional services and new products.

Our grandmothers used almost all flour production for home baking. Many churned their butter, made their own soup, sausage, and salad dressing.

Today, these jobs have been taken over by factory workers and machines. In 1958, 10 million people had jobs storing, transporting, processing, and merchandising farm products. More than 300,000 (with a \$1.5 billion payroll) worked in meatpacking, meat preparation, and poultry processing; 290,000 (with a \$1.3 billion payroll) helped move and process fluid milk, cheese, butter, ice cream, and other dairy foods; 300,000 were employed in the baking industries (earning \$1.3 billion); and 172,000 in fruit and vegetable marketing (with a \$591,000 payroll).

#### MARKETING MARGINS AND COSTS, SOME EXAMPLES

##### Milk: 11 cents to the farmer, 24 cents for the consumer

A USDA study in 1957 indicated that farm value of fluid milk was about 11 cents a quart, retail price 24 cents; that for every dollar spent for fluid milk, the farmer received 45 cents, and 55 cents went for marketing. The marketing costs broke down this way: Payroll, 27 cents; property, 7 cents; containers, 7 cents; supplies and services, 5 cents; advertising and other costs, 5 cents; profits, 4 cents.

By 1961, the farmer's share of the consumer's milk dollar had fallen to 43 cents.

During the 10 years from 1951 to 1961, retail price increased 15 percent; farm value decreased 3 percent, and the marketing margin increased 33 percent. The marketing margin is the charge made by marketing firms for assembling, processing, transporting, and distributing milk.



Labor cost per quart of milk handled was 45 percent higher in 1957 than in 1947-49, while hourly earnings rose 51 percent in this period. More quarts were handled each man hour, so the unit cost did not rise as fast as the cost of hourly wages.

According to the 1957 wholesale price index, paperboard container prices were up 25 percent more in 1957 than in 1947-49, glass containers were up 59 percent. Natural gas rose 16 percent; fuel oil, 42 percent; bituminous coal, 22 percent.

Profits before taxes (per dollar of net worth of leading milk marketing firms) ranged between 20 and 26 percent between 1947 and 1957. Profits before taxes (as a percentage of sales) ranged from about 4 percent to 6 percent.

#### Meat, from ranch to refrigerator

The difference between what the farmer gets for meat on the hoof and what the consumer pays for the meat fluctuates widely. The spread has gradually widened. The farmer's share of the consumer's dollar spent for U.S. choice beef in 1961 was 58 cents; for pork, 53 cents; and for lamb, 49 cents.

Margins for pork increased by about 32 percent from 1949 to 1961; margins for beef widened by 63 percent; and margins for lamb, 46 percent.

In 1961, margins per pound took 33 cents for beef, 33 cents for lamb, and 28 cents for pork. The wholesaler margins were 11 cents for pork, 10 cents for beef, and 11 cents for lamb.

Costs in the meatpacking industry between 1947 and 1958 showed continued increases. In 1947, cost of livestock and other raw material was 81 percent of total sales, with a gross margin of 19 percent.

In 1958, cost of livestock and other raw materials had dropped to 76 percent of total sales, gross margin had risen to 24 percent.

Again, the farmer got less, marketing cost more.

Meat and meat products account for a relatively high proportion of family food spending - 25 to 30 percent - so many retailers try to keep their meat prices stable to attract customer loyalty. On the basis of data in 85 stores in three cities in 1950, the average cost of retailing meat was 10 cents a pound, wholesale weight. This cost is probably higher now.

### Florida oranges, from tree to table

The orange picked off a tree in Florida is very different from the orange the housewife pays for at the supermarket checkout counter. After being picked, the orange is hauled from the grove to the packinghouse. It may be degreened, washed, brushed, waxed, inspected, sorted, packed, loaded onto a railroad car or truck and shipped to market. At the terminal market, it is unloaded, sold, hauled to the wholesaler's warehouse, unloaded, sold to a retailer, loaded and hauled to his store. At the retail store, it is unloaded, moved into the store, put onto the display rack, separated from damaged and spoiled fruit, and finally sold to the consumer.

The marketing charge for a 90 pound box of Florida oranges, sold in New York in 1960-61, averaged \$7.26. The Florida grower received an average of \$3.77 per box for these oranges on the tree, 34 percent of the \$11.05 retail price.

### Cotton, from boll to bedsheet

A bedsheet cost \$2.42 in 1947 and the farmer got 76 cents for the cotton, or 31 percent. In 1961, the bedsheet cost \$2.23 and the farmer got 70 cents for the cotton, 31 percent.

In 1947, a man's business shirt retailed for an average price of \$4.17. The farmer received 28 cents for the cotton, or 7 percent. In 1961, the shirt cost \$4.24 and the farmer's return for the cotton was 27 cents, or 6 percent.

A man's work shirt cost \$1.70 in 1947, the farmer got 27 cents for the cotton, or 16 percent. In 1961, the work shirt cost \$1.74 and the farmer got 25 cents for the cotton, 14 percent.

The spread between the retail price of most cotton products -- and the farmer's share for the cotton he supplies -- has remained fairly stable in the past decade, in contrast to the farmer's share of the consumer's dollar spent for food or tobacco.

The farmer's share (farm value as a percentage of retail cost) varies among products, depending on the amount of labor in relation to the amount of cotton used. In one 1957 study, the farmer's share ranged from 5 percent in a girl's dress to 31 percent for a bedsheet.



### Processed poultry

The road from field to table brings food from every part of our country, and from many foreign countries, in a dependable, expected flow. Many hands and many machines care for and improve food after it leaves the farm gate.

Take broilers as an example. The broiler grower may have 10,000 birds to sell at one time. Someone must catch them, put them into crates and onto a truck, deliver them to the poultry processing plant, where the birds are fed and watered until they fit into the tight schedule on the "line."

Here, killing, scalding, picking, eviscerating, cleaning, inspecting, grading, weighing, chilling, packaging, and storage may all take place within a few minutes. The broilers go to a distributor, who may again store them for a brief time. Finally they are trucked again to the retail store.

But today even this story is an oversimplification. We have not mentioned the poultry that is canned, frozen, precooked, cut up, stuffed, trussed, or eaten in restaurants. Yet, in spite of the fact that more, better quality poultry is available, in the sizes that housewives like, with more white meat and less waste, the average retail price of broilers dropped from 60 cents a pound in 1952 to less than 39 cents in 1961. Returns to farmers (per retail pound) dropped from 40 cents to less than 20 cents, while marketing charges remained about the same.

### White bread an example

White bread is an example of higher retail food prices and lower farm prices. In 1951, the average price of a pound loaf of white bread was about 16 cents; the farm value of the wheat in the bread, 2.6 cents. In 1961, the retail price of bread had risen to about 21 cents, but the farm value of wheat had dropped to 2.4 cents.

### The farmers' share of breakfast

As another example of the marketing spread, consider some typical breakfast foods. In 1961, a quart of milk cost about 25 cents; of this the farmer got about 11 cents. From the 26 cents for a typical box of cornflakes, the farmer got 2.6 cents. Of the 25 cents for a 6 ounce can of frozen concentrated orange juice, the grower received about 11 cents. For a dozen eggs retailing at 55 cents, the poultryman got about 36 cents. For a 21 cent loaf of bread, he got 2.4 cents for the wheat.

## *Food Is a Bargain*

Food prices have risen less than most other things in the past 15 years. Since 1947-49, retail prices of farm foods have gone up only 13 percent, whereas nonfood living costs have climbed 31 percent.

It took 60 hours work in 1947-49 to buy the month's farm food supply for the average family; today, it takes 38 hours. This is the real measure of food prices.

Worker's hourly earnings have climbed 77 percent since 1947-49; farm food prices, only 13 percent.

In the United States, we spend about 20 percent of our take-home pay for food. Britishers spend 30 percent, Russians about 60 percent.

### WHY IS FOOD A BARGAIN?

- Because we can buy the food we want.
- Because farm workers produce 106 percent more food than they did in 1947-49; prices for food (farm value) have dropped 13 percent in the same time.
- Because 1 farmer can now feed (and clothe) 27 other people, compared to 15 people in 1947-49.
- Because food marketing workers turn out about 33 percent more marketing services per man hour than they did 15 years ago.
- Because we spend less of our take-home pay than ever for food - 20 percent today, 26 percent 15 years ago. This leaves more money for recreation and education and other things.
- Because the price of farm food is up only a seventh, prices of nonfood living costs are up a third.
- Because an hour's work will buy 60 percent more farm food than in 1947-49.
- Because, if the cost of domestic farm food had risen as much as the cost of other things, we would have to spend \$1.16 to buy as much farm food as we get for \$1 today.



## LESS WORK FOR MORE AND BETTER FOOD

Food in America has become a better buy, a bargain compared with food in other lands and lower in terms of labor cost than anywhere else in the world. For an hour's pay, our industrial workers can buy a good, normal meal for four persons. In Germany and England, it takes 2 hours work to buy the same meal; in Austria, 4 hours; in France  $4\frac{1}{2}$  hours; in Italy more than 5 hours.

In comparison with Russia, where about 60 percent of the worker's income goes for food, and 2 workers in 5 are on the farm, our production is a phenomenal success: We produce 60 percent more from one-third fewer planted acres, with some 40 million fewer farmers and farm workers (1959).

The daily diet per person in the United States averages 3,000 calories, compared with an estimated requirement of 2,600 calories. Even so, 1 in 10 Americans early in 1961 was not getting an adequate diet.

## WHAT AN HOUR'S WORK WILL BUY

One hour of work by a manufacturing worker in 1947-49 would have bought about 2 pounds of choice beef; in 1961, nearly 3 pounds...milk, 6.5 quarts compared with more than 9 quarts today...2 dozen eggs, compared with 4 dozen today...11 pounds of apples compared with 13 pounds today ...25 pounds of potatoes compared with 37 pounds today.

## FOOD INCREASED FASTER THAN PEOPLE

About 70 percent more farm-grown food was sold in 1961 than in 1940. Population increased nearly 40 percent. Farm population decreased in this period, while city population increased.

When farm people move to the cities, more food must be sold because these people now buy the food they formerly produced on their farms.

## WE ARE EATING BETTER

We are eating more beef and pork, more poultry and more dairy products than we did 25 years ago.

In 1962, compared with 1935-39, each of us ate --

163 pounds of meat, instead of 127;  
37 pounds of poultry, instead of 16; and  
377 pounds of dairy products, instead of 357.

## MORE FOOD SERVICES

Meals eaten away from home account for about \$1 of every \$4 spent for food. More people have jobs away from home and eat their lunch in restaurants and cafeterias. Half the cost of these meals is for preparation and service.

There is 30 percent more service built into each unit of food now than there was in 1940.

When we buy prepared food, we pay for factory, labor, management, and other costs, plus what the farmer gets.

We are, of course, buying convenience -- freedom from kitchen chores. We also are buying food with less waste, that needs less trimming, sorting, or washing.

In 1953 costs of actual meals prepared were compared for 2 days -- for a family of four -- from foods purchased ready to serve, and from those prepared in the home. Three ready-to-serve meals cost almost \$7. The same food, prepared in the home, cost less than \$5. But the "ready-to-serve" meals cost the homemaker only about  $1\frac{1}{2}$  hours, the home-prepared food cost her  $5\frac{1}{2}$  hours. The saving of almost \$2, for preparing the food at home, represented about 50 cents an hour for the housewife.

Those are the two extremes. Most families use a combination of foods -- unprepared, partly prepared, and ready-to-heat-and-serve.

## HAVING THE FOOD WE WANT MAKES FOOD A BARGAIN

We want high quality, low cost orange juice the year 'round. Canned frozen concentrate now makes this possible.

We want strawberries year round, with the same good red color and flavor of the summer fresh fruit. New varieties and quick freezing now provide us with near-fresh fruit quality all year.

We preferred the flavor of freestone peaches to the cling variety. Now good canned freestones are commonly available.

People living alone and apartment dwellers wanted smaller packages; such packages are now in the stores. We wanted economy-size packages for the modern large family; these are available too.



Small increases in farm prices have little effect on retail food prices, simply because the farmer gets only about 38 cents out of each \$1 we spend for food. Saying it another way, the farm price of food must increase about 3 percent before the retail price increases 1 percent.

Retail prices of farm grown food have remained fairly stable, during 1961 and 1962.

Food-at-home prices have increased only 2 percent since 1957-59. The greatest increase was for fish (10 percent). Food-away-from-home prices increased 12 percent; all food prices increased 3.5 percent. The Consumer Price Index increased 5.8 percent in the same period.\*

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\* For more details on this, write to Economic Research Service, USDA, and ask for the National Food Situation.

# *Sharing Our Abundance*

## MORE FOOD TO MORE PEOPLE

In a country characterized by agricultural abundance, it is natural that we try to see that needy and deserving people have the food they require for health and work.

We rely on business to supply the great bulk of our food, to register our preferences as consumers, and to pass back to farmers a fair return for their productive efforts. When the Federal and State governments step in--whether in production, marketing, or distribution--it is to improve the working of the commercial system in our farm and food economy.

We do not ignore people here at home who need, but cannot afford, more and better food. Lack of money is not the only reason for our underconsumption of food. The marketing system often cannot handle seasonal abundances. This difficulty may reduce benefits to both housewife and farmer.

Even among middle or higher income families, food competes with the almost endless variety of nonfood items that command attention and dollars. Among all income groups, there are families who do not realize the importance of good diets, families who don't make good selections, and the "crash dieters."

All of these situations get attention in the operation of USDA Food Distribution Programs. But, where Federal financial assistance is involved, it is the needy child or the needy family that the Department has foremost in mind. These people are the ones with the greatest potential for increased food consumption. They also are the ones where money is the most important limit to diet improvement and market expansion.

Direct Federal action in this field began during the depression of the 1930's and has continued since that time. However, more recent economic and social developments--including special problems faced by local governments in some areas--have led to more intensive efforts to get more of our food to more of our people.

"Food distribution" is a series of interrelated action programs to improve national diet levels and to expand markets for food. The activities include:

1. The Plentiful Foods Program - promotes the use of seasonally abundant and other abundant foods.



2. The National School Lunch Program - assists elementary and secondary schools to serve balanced, moderately priced lunches to children.
3. The Special Milk Program - inaugurated in 1954, helps schools, camps, orphanages and other non-profit institutions make more milk available to more children.
4. Direct Distribution - donates Federally owned foods to schools, charitable institutions, and needy families through State and local governments.
5. Pilot Food Stamp Projects - A program inaugurated in mid-1961 in selected areas to test out another approach to increasing food consumption among needy families. The pilot projects were extended to 25 more areas in the winter of 1962-63.

#### Plentiful foods program

The program increases the commercial marketing of foods in peak seasonal supply. It is built on the principle that advertising pays. The Food Trade staff works with merchandising, information, and education people in food trade groups to support the sales and promotion work of producer groups. Food Trades people attempt to shift consumer demand toward current market supplies. The program can achieve permanent changes by introducing a particular food to more consumers generally--or into new geographic areas.

The Department cooperates with food retailers, food editors, and food and nutrition leaders who work directly with consumer groups.

Each month Plentiful Foods Lists are issued to trade and information groups. The public feeding industry--hotels, restaurants, industrial feeders--get an especially adapted version of these lists. Special selections are made for school lunch programs.

#### National school lunch program

Federal financial assistance to school lunch programs began in the early 1930's when surplus foods were first donated to schools.

Much earlier than that, the Department had been active in this field. Before World War I, charts were prepared to illustrate a balanced and wholesome school lunch.

The National School Lunch Program now encompasses a broad assistance program to participating schools. Each school agrees to serve a lunch meeting minimum requirements (called the Type A lunch). This includes: A protein-rich food, a generous serving of fruits and vegetables, bread and butter or fortified margarine, and one-half pint of milk. Federally donated foods are used to help fulfill these requirements, but only within the framework of the (Type A) pattern. Most of the food used in Federal school lunch programs is bought locally by the schools from local suppliers. The following table shows the relative importance of locally purchased and Government-donated foods in the 1962 National School Lunch Program:

<u>Sources of Food</u>	<u>Million dollars</u>
Local Purchases:	
Financed by Federal funds	\$ 98.8
Financed by State and local funds	<u>501.2</u>
Total.....	\$600.0
Government-donated foods:	
Purchased for the program	69.4
Obtained from other Department supplies	<u>113.0</u>
Total.....	<u>182.4</u>
Grand Total.....	\$780.4

The National School Lunch Program aids 65,000 schools throughout the country. These schools represent about two-thirds of all elementary and secondary school students. On a typical day, about 14 million children eat the approved Type A lunch--about one-third of all children in schools. Cash assistance averages about 4 cents a lunch. Another 2 million benefit from Federal food donations, but not cash assistance.

Many schools in economically needy areas have a special problem. The National School Lunch Act requires that children unable to pay the full lunch price (determined by local school authorities) be served at a reduced price or free. About 10 percent of all lunches served are free or at a reduced price. If a child cannot pay, his lunch is financed out of the Federal payment, State or local sources, or the payments of other children. Far too often, however, this help has not been enough in a school that has to serve 30, 40, or 50 percent of its lunches free.

In 1961, Congress authorized \$2.5 million for special commodity assistance to help "schools which because of poor local economic conditions (1) have not been operating a school lunch program or (2) have been serving free...at least 20 percent of the lunches to children." Especially needy schools may now be reimbursed up to 15 cents for each Type A meal they serve. The regular maximum payment is 9 cents.



### The special milk program

Participating schools and institutions buy fluid milk from local dealers, and the Federal Government reimburses the school for part of the milk cost. In places where milk is sold to children, the Federal payment makes reduced prices possible. In places where milk is not sold to children, such as in orphanages, the institution uses the Federal payments to make more milk available.

About 2.6 percent of our fluid milk is now marketed under this program, about the same amount as in the National School Lunch Program. The program is available to three out of four U. S. school children.

In 1955, the Department of Agriculture canvassed 22 centralized school systems with almost 1 million students. Two-thirds more milk was used in October of that year as in October of 1953, the year before the Special Milk Program was started.

### Direct food distribution

For more than 25 years, the Department of Agriculture has had authority to donate food (acquired under price support and other market stabilization programs) to underconsuming groups in this country.

Donated foods are distributed outside normal business channels. The Federal Government delivers the food to States. State and local governments arrange for the subsequent handling and storage and for the actual delivery of the foods to the final recipient.

State and local welfare agencies determine which families get foods. Local needs and local conditions are taken into account. One family may be in a small rural town; another may live in a large urban area where living costs are much higher.

State standards used to select families must relate to State public assistance standards. This does not mean that only public assistance families are eligible: Foods are made available to "marginal" families--to those, for example, who suffer temporary setbacks when factories close down or during a season when there is no work.

In December 1962 a total of 7.4 million people in needy family units were receiving donated foods. The retail value of these donations came to about \$6 a person a month. In 1961, about 6 million people were in the program.

Recipients are not only getting more food, they are also shown how to make the best possible use of it. Recipes and menus, group demonstrations, television and newspaper articles help families make wise use of both donated and purchased foods.

#### Pilot food stamp projects

A new method is being tested to increase food consumption levels among needy families, using normal trade channels.

The initial pilot projects operated in eight sections of the country to test the program under a variety of conditions: City of Detroit; Franklin County in the coal mining area of southern Illinois; the Virginia-Hibbing-Nashwauk area in the Mesabi iron range of Minnesota; Floyd County in Kentucky; McDowell County in West Virginia; Fayette County in Pennsylvania; San Miguel County in New Mexico; and Silver Bow County in Montana. An additional 25 were added in 1962. All of these areas have experienced substantial chronic unemployment.

Under the pilot program, low-income families exchange the amount of money they would normally be expected to spend for food for stamp coupons of a higher money value. For example, a family of four who normally could be expected to spend about \$60 a month for food can exchange that amount of money for as much as \$90 worth of coupons. The extra \$30 represents the Federal Government's contribution.

The family can then use the coupons to purchase food at retail prices, at any regular retail store approved to accept the coupons. Only a few food items cannot be purchased with the food coupons--coffee, tea, cocoa, bananas and packaged imported items.



# *Fair Play in the Marketplace*

## GRADING, GETTING YOUR MONEY'S WORTH

Shopping for food today is much more complicated than it used to be because we buy more things from a greater variety on the shelves. Most grocery stores have a bewildering display of foods. Some of the larger ones carry as many as 8,000 items.

Food prices often include the cost of USDA grading, which enables the busy housewife or the wholesale buyer to make buying decision more easily and accurately.

Grading enables us to know the quality of the food we buy. Some products are also graded for size; eggs, for example, are marked Grade A Large, Medium, Small or whatever their size.

Buying graded foods does not necessarily mean buying only the best or most expensive. Grades offer a choice of quality, so the buyer can pick the most suitable item for a particular purpose--for example, top grades of eggs for poaching or frying, lower grades for cooking and baking.

In fiscal 1962, an estimated 90 percent of frozen fruits and vegetables were sold on the basis of Federal-State grade standards, and 60 percent of canned fruits and vegetables were graded.

About half of our beef is graded; as is 40 percent of broilers and 80 percent of turkeys.

Graded products also include 19 percent of shell eggs, 84 percent of dried eggs, 58 percent of butter, 70 percent of nonfat dry milk, 70 percent of the rice, 75 percent of the peas, and 36 percent of the beans.

## MORE WHOLESOME AND SAFER, CHEAPER IN THE END

Our foods are safer and more wholesome than ever before. Today's shopper does not ask, "Is this food safe for my family?" Eating in a restaurant, one does not ordinarily question the safety of eating away from home. We almost automatically assume that the food we eat is pure, safe, wholesome, and nutritious. This feeling of confidence began with passage of the Federal Meat Inspection Act of 1906. It has been sustained through more than half a century by conscientious, rigid, inspection and by extension of inspection to other foods.

Food safety begins with farmers and ranchers, who use the latest research to protect crops and livestock from pests and diseases that could impair food. Food safety continues from the farm through marketing into our grocery stores. Our meat and poultry inspection systems are the envy and models of the world.

Nearly 25.6 billion pounds of red meat on a dressed weight basis were inspected and certified as wholesome in 1962. This included 12 billion pounds of beef, 12.4 billion pounds of pork, 695 million pounds of lamb and mutton, and 595 million pounds of veal. Of this total, some 18 billion pounds were reinspected during processing into various prepared meat foods, such as frankfurters, sausages, frozen meat dinners, and canned meat products.

But, as a safeguard to consumers, inspectors condemn and divert from food channels over a million pounds of meat and meat products each working day, because of disease, spoilage, or contamination.

More than 6.2 billion pounds of poultry (ready-to-cook weight) were certified as wholesome by USDA inspectors in fiscal 1962. Poultry inspection began as a voluntary service but became mandatory for interstate shipments in 1959.

The direct cost of inspection--about a penny a month per person--is in our tax bill. The cost of the condemned meat is shared by producers and consumers.

About 4.7 billion pounds of dairy products were graded in fiscal 1962. This included 1.6 billion pounds of butter ( 58 percent of production), 423 million pounds of cheese (20 percent of production), 2.5 billion pounds of dry milk (70 percent of milk produced for human food).

About 200 million pounds of consumer-packaged butter were grade-labeled.

Inspection of fresh and processed fruits and vegetables provides a vital service to this mass buying and selling industry. Federal or Federal-State inspection, on a fee basis, reduces the risks involved in long-distance trading. In fiscal 1962, more than 1.6 million carloads (equivalent) of fresh vegetables and fruits were inspected--more than in any recent year.

The volume of processed products inspected has also continued to increase. More than 2.6 billion pounds of frozen fruits and vegetables and 200 million cases of canned fruits and vegetables were inspected in 1962, 10 percent more than in 1961.

A new sedimentation testing service for wheat has been initiated. Outside of an actual baking test, sedimentation value--a measure of the amount and quality of gluten in wheat--is believed to be the best single indication of the bread-baking strength of flour.

Inspection of grains under the United States Grain Standards Act increased 18 percent over 1960, rising to an all-time high of 3.6 million inspections.



A major activity on livestock programs in 1962 was the further development and demonstration of a dual-grading system for beef carcasses and slaughter cattle. This provides separate identification of differences both in quality of the meat and in yield.

All of the tobacco sold in 1961 on the 177 auction markets in the United States--nearly 2 billion pounds--was Federally inspected. Tobacco ranks fifth among all crops in cash farm income and is the leading money crop in several States.

Services on naval stores included inspection and grading of a total equivalent to 360,000 drums of rosin, and inspection and certification of 4.6 million gallons of turpentine.

### MARKET NEWS

Federal and Federal-State market news service is supplied by 170 full-time market news offices. More than 1,400 daily newspapers, 150 television stations and 1,500 radio stations relay this news to producers, middlemen and others. News reports are published for all major commodities, reporting on prices, supplies, and other market conditions affecting source of farm products. They may be published several times a day, daily, weekly, or monthly.

The dairy and poultry market news service has expanded its coverage of weekly movement of butter and eggs into retail channels and of weekly cold-storage movement. Information on foreign markets is now distributed.

In livestock market news, more emphasis was placed on auction markets and direct sales and on meat and wool reporting, as declining lamb and beef prices presented special problems to the livestock industry.

In fruit and vegetable market news, activities at the actual shipping point is getting more attention, because there is more direct buying from these producing areas. Coverage was expanded during 1962 to important shipping areas in Pennsylvania, Missouri, Indiana, Virginia, Michigan, Minnesota, Colorado, Oregon and California. A new method for reporting truck and rail unloads in leading receiving markets has made this information more usable, especially for growers and shippers.

Grain market news was expanded in 1962 to report more interior markets in California and Louisiana, because these markets became more important barometers of trading during the year.

Tobacco market news was furnished to all auction markets and the trade throughout 1962. About 80 percent of the 1 million copies of reports issued were furnished directly to growers for use at the time their tobacco was offered for sale.

## STANDARDIZATION

The U.S.D.A. now has about 500 sets of standards applicable to more than 300 major agricultural commodities.

Mass distribution of fruits and vegetables depends especially on fairly standardized and uniform produce. In fiscal 1962, 296 standards were in effect on fresh and processed fruits and vegetables and their products.

Federal specifications for fresh whole milk, process Swiss cheese, nonfat dry milk, and cultured buttermilk were revised.

Official standards for rice, barley, mixed grain, cotton and poultry were revised to make for greater usefulness in marketing.

## REGULATORY FUNCTIONS

Enforcement of regulatory acts insure fair dealing between buyers and sellers, keep the private enterprise system actively competitive, and make the bargaining power of producers more nearly equal to that of the buyers.

The Packers and Stockyards Act helps to maintain open competition in the livestock industry and protect the industry from unfair and discriminatory trade practices.

Under the Packers and Stockyards Act, a nationwide investigation of the lamb industry was completed, resulting in a complaint being issued against seven major meat packers, three national food chains and two lamb dealers. These cases are now pending.\* An examination of the hog buying practices of packers in the Southeastern States revealed that many were arbitrarily reducing the agreed purchase price after taking possession of the hogs. This practice has been informally corrected.

More than 5,000 livestock scales were tested in fiscal 1962. Tests disclosed (and led to correction of) nearly 1500 inaccuracies. About 6,000 scales are posted for inspection. At the end of fiscal 1962, 2200 stockyards were posted, almost 3,000 packers were subject to the Act, 80 formal cases were completed. Also, almost 500 informal complaints were settled without litigation, with more than \$136,000 paid to complainants. 15,000 market agencies and dealers were registered under the Act, an increase of 3,000 during the year. 10,000 market agencies and dealers were bonded for more than \$120 million, to assure payment for livestock.

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\* March 1963



The Perishable Agricultural Commodities Act establishes and maintains a code of good business conduct for the produce industry. It requires that interstate traders in the fruit and vegetable industry be licensed. The law authorizes the Department of Agriculture to suspend or revoke a trader's license for violating the Act. It recently had its first major overhaul since the regulations were originally issued in 1930.

On misbranding of products alone, investigators visited 1079 firms and examined nearly 3,500 lots of produce to verify grade, size, state of origin, variety, net weight, and other pertinent markings. More than 1,100 other lots of produce were spot-check inspected at destination markets, and 63 certificates were issued covering misbranding violations.

The U.S.D.A. closed 2,223 cases under the PAC Act in fiscal 1962.

The Federal Seed Act protects farmers, homeowners, and other seed users by guarding them against the sale of misrepresented seeds.

Prosecution under the Federal Seed Act was successful in 25 cases and 4 seizure actions were completed. Imports of agricultural and vegetable seeds totaled 366 million pounds, the largest quantity in any year since the Federal Seed Act became effective in 1939.

The U.S. Warehouse Act authorizes licensing of storage houses for agricultural commodities and periodic examination of licensees by the Department for financial responsibility and condition of facilities and stored products, in order to protect farmers and other patrons. Federally licensed warehouse receipts for commodities are accepted at face value by traders and financial institutions.

Protective benefits offered to farmers and others were further extended in 1962. The program of warehouse examination required for licensing and bonding under the Act now covers a total storage space for 1.3 billion bushels of grain and 14 million bales of cotton.

The Commodity Exchange Authority strives to assure correct registration of prices, protects the "hedging" services of the futures markets, and assures fair practices in futures.

Futures prices must be protected against unfair or manipulative trading because they are used as guides in the buying and selling of "cash" wheat, corn, cotton, and other crops at country points and at terminal markets.

Hedging, which is the nonspeculative buying or selling of futures to offset or diminish price risks in handling actual commodities, is commonly engaged in by merchants, processors, farmer cooperatives, and some individual farmers. It is an operation which obviously depends for its effectiveness on fair trading practices.

The CEA supervised futures trading for 17 commodities in fiscal 1962. The total of transactions-- 9,912,000--was the second largest on record.

The dollar value of regulated futures trading was estimated to be \$36.7 billion.



## *Exports and Imports*

### FOREIGN AGRICULTURAL TRADE IS BIG BUSINESS

Agricultural exports and imports are a booming business, affecting the entire Nation's economy. Almost every one of us is touched in some way by the buying, selling, and shipping of the \$8 billion to \$9 billion worth of agricultural commodities moving in or out of our ports every year.

To the business world that services this trade and makes it flow, it means profits and jobs. To the farmer who produces for export, it means more buyers for his products. To the consumer, it means the coffee or tea on his breakfast table, some of the rubber for his tires and many other things he takes for granted--such as chocolate, and bananas and other tropical fruits. It means the extra things which, when combined with our own production, give us the highest standard of living in the world.

### Provides employment

In 1960, U.S. employment attributed to exports of farm goods was 940,000. Of this, 540,000 was direct and 400,000 indirect. Employment in nonfarm manufacturing and processing employment in the food, textile, and allied industries is not included.

State distribution of the domestic employment attributed to U.S. exports ranged all the way from 129,000 in Texas, 65,000 in Mississippi, and 61,000 in Arkansas, to as few as 100 in Rhode Island.

For every 1,000 farm workers producing for export, an estimated 16 workers are employed in domestic transport, 17 as domestic agents, traders, and tradesmen, and 7 employed in shipping and stevedoring.

Some 57,000 are employed in food processing, 12,000 in tobacco production--all part of the farm export trade.

## Adds to farm income

The world market continues to be an important outlet and source of income for American farmers. In fiscal 1962, U.S. agricultural exports set a value record, and volume equaled the 1961 peak. Value of \$5.1 billion was more than 4 percent above the previous record in 1960-61.

The export value of \$5.1 billion was equivalent to a sixth of cash receipts from farm marketings. One acre of every five harvested produced for export. The output of 63 million acres of U.S. cropland moved abroad last year. Exports accounted for half of our production of wheat, dried peas, rice, and hops; two-fifths of our nonfat dry milk and tallow; one-third of our cotton, soybeans, dried prunes, and tobacco.

## EXPORTS

### U.S. world's largest exporter of farm products

The total volume of all world farm exports has been rising, and in 1962 U.S. farmers supplied one-fifth of the total, or more than any other nation. That year, our farm exports needed financing, transporting to ports, storing, and ocean shipping for 45 million tons of cargo--enough to fill over a million freight cars or 4,500 cargo ships, an average of 12 shiploads every day of the year.

### Government programs aid exports

Of the \$5.1 billion of farm exports in 1961-62, \$3.5 billion were commercial sales for dollars and \$1.6 billion were moved under Government programs (Public Law 480 and the Mutual Security Act; see Glossary).

To enable major products (such as wheat, cotton, and feed grains) to compete in world markets, the Commodity Credit Corporation made export payments or sold stocks at less-than-domestic-market prices. The export assistance, mainly in the form of export payments, totaled \$600 million. (This amount is not included in the value for agricultural exports.)

Total Government program exports were valued at \$1,650 million in fiscal 1962, or 31 percent of total U.S. exports. Total Public Law 480 exports were \$1,576 million and AID programs were \$74 million. The Public Law 480 exports included \$1,015 million of foreign currency sales (Title I), \$176 million of emergency relief (Title II), \$196 million bartered (Title III), and \$169 million of donations.



Exports by commodities--fiscal year 1962  
(except where noted otherwise)

- WHEAT--New export record for grain (and flour equivalent of grain):  
716 million bushels, valued at \$1,283 million; 70 percent (quantity) moved under P.L. 480 and AID programs. Exports were 58 percent of U.S. 1961 wheat production, and 43 percent of world wheat trade.
- COTTON--Exports of 4,769,000 running bales valued at \$664 million;  
25 percent (quantity) moved under P.L. 480 and AID programs.  
Exports were one-third of U.S. 1961 cotton production.
- SOYBEANS--New export record of 147 million bushels, valued at \$374 million;  
3 percent (quantity) moved under P.L. 480 and AID programs. Although included under the price support program, soybeans moved abroad without export payment because world prices have been above the domestic market. Exports were one-fifth of the U.S. 1961 soybean crop, and 86 percent of world soybean trade (calendar year 1961).
- SOYBEAN AND COTTONSEED OILS--Exports of 1,319 million pounds (70 percent soybean oil and 30 percent cottonseed oil), valued at \$176 million;  
60 percent (quantity) moved under P.L. 480 and AID programs. Exports were 20 percent of U.S. 1961 oil production; soybean and cottonseed oils (plus oil equivalent of exported seeds) represented about 78 percent of world trade in these oils (calendar year 1961).
- RICE--Exports of 20.3 million bags (milled rice) valued at \$132 million;  
47 percent (quantity) moved under P.L. 480 and AID programs. Exports were 54 percent of U.S. 1961 rice production, and 15 percent of world rice trade (calendar year 1961).
- FEED GRAINS--New export record for combined volume of corn, barley, oats, and grain sorghums: 14.6 million metric tons valued at \$727 million;  
27 percent (value) moved under P.L. 480 and AID programs. Exports were 29 percent of U.S. 1961 feed grain sales by farmers, and 53 percent of world feed grain trade. U.S. corn exports were largest on record.
- TOBACCO--Exports of 520 million pounds tobacco valued at \$407 million;  
19 percent (quantity) moved under P.L. 480 and AID programs. Exports were 30 percent of free world tobacco trade (calendar year 1961).
- LARD--Exports of 433 million pounds, valued at \$43 million, shipped commercially for dollars. Exports were 17 percent of U.S. lard production, and 57 percent of free world lard trade (calendar year 1961).
- TALLOW AND GREASES--Exports of 1.8 billion pounds valued at \$127 million;  
13 percent (value) moved under Government programs. Exports were more than two-fifths of U.S. production, and three-fourths of world trade (calendar year 1961).



DAIRY PRODUCTS--Exports of 716 million pounds (whole milk equivalent) valued at \$128 million; 56 percent (value) moved under export programs. Exports were about 1 percent of U.S. milk output (calendar year 1961) and they included 809 million pounds nonfat dry milk, 8 million pounds cheese, and 68 million pounds evaporated milk.

POULTRY--Exports of \$101 million of poultry and poultry products; less than 1 percent (value) moved under Government programs. Exports included record 300 million pounds poultry meat, about 4 percent of U.S. output, 46 percent of free world trade (calendar year 1961); 18 million dozen eggs, less than 1 percent of U.S. output; 18 million day-old chicks; and 9.7 million pounds egg solids.

VARIETY MEATS--Record exports of 124 million pounds, valued at \$26 million. Exports were 6 percent of U.S. 1961 output (calendar year). Exports were mainly beef and pork livers and beef tongues.

HIDES AND SKINS--Record exports of 11.4 million pieces valued at \$84 million. Exports were one-fourth of U.S. 1961 output (calendar year).

FRUITS--Second highest export value, \$282 million; less than 1 percent (value) moved under Government programs. Export value was about 17 percent of U.S. 1961 commercial sales. It included \$116 million fresh fruits, \$69 million canned fruits, \$46 million dried fruits, and \$44 million fruit juices.

VEGETABLES--Export value of \$136 million; less than 1 percent (value) moved under Government programs. Export value was about 8 percent of U.S. commercial sales. It included \$50 million fresh vegetables, \$28 million dried peas and beans, and \$29 million canned vegetables.

#### Exports by country in 1961-62

While over 125 countries take agricultural exports from the United States, 15 countries accounted for 70 percent of the total in fiscal year 1961-62. In terms of retained commodities, Japan continued as the No. 1 market, followed by the United Kingdom. The decline in exports to both Japan and the United Kingdom reflected smaller cotton exports due to the world wide decline in cotton textile consumption and a drawing down of inventories there. Exports to West Germany and the Netherlands increased last year, resulting mainly from stockpiling of commodities toward the end of 1961-62 in anticipation of the Common Market's higher charges on agricultural imports as of July 30. Better grain harvests in India reduced import needs under P.L. 480.



U.S. agricultural exports: Value for 15 leading countries  
by country of destination, fiscal year 1960-61 and 1961-62

Country	1960-61	1961-62	Change
	--Million dollars--		Percent
Canada 1/.....	456	521	+ 14
Japan .....	553	486	- 12
United Kingdom .....	467	459	- 2
West Germany .....	320	416	+ 30
Netherlands .....	324	348	+ 7
India .....	346	235	- 32
Italy .....	213	191	- 10
UAR-Egypt .....	100	161	+ 61
Belgium .....	131	130	- 1
Spain .....	157	126	- 20
Yugoslavia .....	57	116	+104
Turkey .....	36	112	+211
Brazil .....	70	107	+ 53
France .....	112	99	- 12
Venezuela .....	83	87	+ 5
Other .....	1,521	1,545	+ 2
Total .....	4,946	5,139	+ 4

1/ Includes intransit commodities placed in bonded storage in Canada and used to "top off" ships moving through the St. Lawrence Seaway: Estimated at \$60 million in 1960-61 and \$90 million in 1961-62.

### The export market by states

Every State has a stake in the export market for U.S. agricultural products. The export record of \$5,139 million in fiscal year 1961-62 was equivalent to 15 percent of total cash receipts from farm marketings.

WHEAT--Wheat exports represented 59 percent of cash receipts from wheat. Exports were a big factor in 10 States: Kansas, North Dakota, Oklahoma, Nebraska, Texas, Washington, Montana, Illinois, Colorado, and South Dakota.

RICE--Half of the receipts from rice sales were derived in the export market. Rice exports made a significant contribution to cash farm income in Arkansas, Louisiana, Texas, and California.

TOBACCO--Over 30 percent of the receipts from tobacco came from the export market. A substantial part of the flue-cured tobacco grown in North Carolina, South Carolina, Georgia, and Virginia entered into the overseas market. Also, substantial amounts of Maryland tobacco were exported.

COTTON--Exports of cotton added up to 30 percent of cash receipts from cotton. Foreign sales were an important source of farm income in 10 States: Texas, California, Arkansas, Mississippi, Arizona, Georgia, North Carolina, South Carolina, Alabama, and Tennessee.

FEED GRAINS--Only a relatively small part of feed grain output enters the export market, but exports represented 29 percent of cash receipts for this commodity group. These exports were important in the North Central and South Central Regions of the United States.

LIVESTOCK AND PRODUCTS--Exports of livestock and livestock products were equivalent only to 3 percent of cash receipts from farm marketings.

OTHER COMMODITIES--A large number of other agricultural products, amounting to 16 percent of cash receipts, entered into the export market. This group included such items as dried beans, dried peas, hops, raisins, and prunes.

### COMMON MARKET IMPORTANT

Our farmers need the Common Market as a major foreign customer for their goods. In fiscal 1962, the six Common Market countries (West Germany, France, Netherlands, Italy, Luxembourg, and Belgium) bought \$1.2 billion worth of U.S. farm products, with payment in dollars. This is 23 percent of our total farm exports.

### The Common Market explained

Eventually commerce within the Common Market will be carried on freely--much as it is among the States of the United States. There will be no tariffs among individual countries making up this customs union, and no restrictions on movement of goods, capital, services, and workers. Like the United States, the Common Market as a unit, will have single policy on imports from "outside" countries.

Important steps toward merger already have been taken. Internal tariffs were cut 50 percent and quota restrictions on industrial goods traded among member countries were abolished on July 1, 1962.

### Size of Common Market

In 1960, the 170 million population of the Common Market was close to that of the United States. Another 55 million was added by the overseas countries and territories. Addition of countries seeking membership or association could bring the population to over 300 million.



The Common Market is one of the most intensively industrialized areas of the world. It turns out steel, automobiles, machinery, chemicals, textiles, optical equipment, and thousands of other manufactured items. It has a superb transportation system. Technological skills of workers are high.

The United Kingdom, for many years our biggest export customer, has applied for Common Market membership. If we add the United Kingdom to the present six members, the group accounts for 32 percent of our total farm exports and 46 percent of our agricultural dollar exports. It would be a serious setback if our farmers lost any important part of this market.

### Future of Common Market

Although the future for a third of our agricultural exports is in some jeopardy, prospects for the balance are good. For some commodities (including cotton, soybeans, hides and skins, and tallow) our exports should expand as the Common Market continues its economic expansion. These commodities represent about \$700 million in agricultural exports to the six countries and the United Kingdom.

### Foreign agricultural trade of continuing importance

Our Nation is constantly concerned with maintaining and improving friendly trade relations with other nations. If they consider us as a reliable source for their agricultural imports, American farmers can play an important role in world affairs.

By increasing exports, the farmer can make a substantial contribution, both to our increased economic growth and toward reducing our current deficit in international payments.

Continued exports is also an important way to provide payments for the agricultural and other products we must import. This trade will continue to help keep our standard of living what it is, the highest in the world.

A 1958 study showed that, with two or three exceptions, every section in this country--including farm districts--has gained more from exports than it has lost from imports.

### IMPORTS

#### 1961-62 agricultural imports rose 3 percent in value

U.S. agricultural imports in fiscal 1962 (July 1961-June 1962) were \$3,767 million, 3 percent above the 1961 total. Volume increased by 7 percent. The import picture in 1961-62 was marked by divergent movements of complementary (noncompetitive) and supplementary (partially competitive)

products. Supplementary imports gained 13 percent in value and 15 percent in quantity. Complementary items fell 6 percent in value but increased 1 percent in quantity.

The U.S. is the world's second largest importer of agricultural goods, accounting for about one-sixth of world agricultural imports. The United Kingdom is the world's leading agricultural importer.

#### Imports relatively stable

While U.S. population has risen about 50 percent since the late 1920's, the volume of agricultural imports rose only about 12 percent. The import quantity index (1952-54 equals 100) rose to 109 in fiscal 1962, from an average of 94 in 1925-29. Higher world prices, for the most part, account for two-thirds of the rise in value since the late 20's.

#### Supplementary commodities half of agricultural import value

During the 1950's about 44 percent of our agricultural imports supplemented our U.S. agricultural output. Since 1959, supplementary imports (those that compete with American grown products) have risen to half of the total agricultural imports, mainly due to larger purchases of cattle, meat, fruit, vegetables, copra, and tobacco. Meat and nonbreeding cattle imports (the major factor in the recent rise) totaled \$539 million in 1962, compared with \$398 million in 1960-61.

Some fruits and vegetables are imported, mostly from Canada and Mexico, and mostly during the winter and early spring. Also imported are cheese specialties, certain hides and skins, short harsh Asiatic cotton, and various Oriental tobaccos (varieties either not produced at all in the United States or not produced in large enough volume to meet demand). Other important supplementary imports are sugar, vegetable oils, nuts, and some grains.

#### Supplementary imports smaller than exports

During the past 3 decades, supplementary imports have exceeded agricultural exports only twice--by \$135 million in 1937 and \$279 million in 1941. Total (supplementary and complementary) agricultural imports exceeded agricultural exports in 18 of the past 30 years, during the 1930's and 1950's.

During the 1950's, 56 percent of U.S. agricultural imports were complementary (noncompetitive items not produced in commercial value in the U.S., except for some bananas and coffee in Hawaii) to U.S. production. Since 1959, complementary products have accounted for half of the agricultural total. Major complementary items are coffee, crude natural rubber, cocoa beans, carpet wool, bananas, tea, spices, and cordage fiber.



### Domestic prices important to imports

Agricultural imports show a definite response to price changes in the domestic market. Higher domestic prices stimulate imports; lower domestic prices discourage them.

An example is the recent fluctuation in cattle and meat imports as domestic prices changed. Reduced cattle slaughter in 1958, accompanied by higher prices for processed beef, caused imports of nonbreeding cattle and meat to reach \$507 million in fiscal 1959. As domestic slaughter increased, in the summer of 1960, slaughter cow prices broke sharply. Nonbreeding cattle and meat imports fell to \$398 million in 1961. In fiscal year 1962, imports of nonbreeding cattle and meat imports increased to \$539 million. Larger-than-normal beef imports since 1959 are associated with low slaughter, which in itself has resulted in cutter and canner cattle bringing more than \$12.00 a hundredweight. When prices have remained below this level, imports have dropped sharply.

### Most imports unrestricted

Legislative authority exists to regulate imports of commodities only under specified conditions. For example, whenever imports interfere with the marketing quota program, price-support or other programs conducted by the Department of Agriculture, the law provides for regulation of such imports under Section 22 of the Agricultural Adjustment Act. Commodities now controlled under Section 22 are wheat and wheat products, cotton and certain cotton products, certain manufactured dairy products, and peanuts. Sugar imports are regulated by quotas under the Sugar Act of 1948, to provide a stable market for domestic sugar.

### Most import duties relatively low

About 55 percent of agricultural imports in fiscal 1962 were duty free, including nearly all of the complementary commodities. For the 45 percent of imports which were dutiable, the ad valorem equivalent of all duties averaged 11 percent. The ad valorem equivalent for all agricultural imports --both free and dutiable--averaged 6 percent.

### Half of agricultural imports from 10 countries

The U.S. imports agricultural products and commodities from more than 125 nations, but over half comes from only 10 countries. In fiscal 1962, 53 percent came from these 10 countries, which shipped more than half of both supplementary and complementary commodities we imported. Most major suppliers are predominantly agricultural.

## U.S. agricultural imports, by country of origin, fiscal 1962

Our leading supplier of agricultural commodities is Brazil, with a total of \$485 million, of which \$398 million is complementary goods (mostly coffee) and \$87 million supplementary. Complementary goods are those not produced in commercial quantities on our mainland. Supplementary goods are those normally grown in this country, but which supplement our production.

Mexico is second, with a total of \$274 million, of which \$180 million is complementary and \$194 million supplementary. Philippines is third with a total of \$244 million, of which \$10 million is complementary and \$234 million supplementary. Colombia is fourth, with a total of \$207 million, \$199 million complementary. Canada is in fifth place; its agricultural exports to the United States totaled \$204 million. Of this, \$200 million is supplementary.

The other supplying nations, in order of importance, are Australia, \$168 million; New Zealand, \$131 million; Dominican Republic, \$99 million; Peru, \$95 million; India, \$80 million; other, \$1,770 million.

### COMPLEMENTARY IMPORTS BY COMMODITIES--FISCAL YEAR 1962

COFFEE--3 billion pounds, valued at a 10-year low of \$947 million; more than three-fourths from Latin America, mainly Brazil and Colombia. Coffee accounted for 25 percent of agricultural imports. The United States buys over half of world coffee exports.

CRUDE NATURAL RUBBER--932 million pounds, valued at \$231 million, well below the 1955-59 average; practically all from Asia. Rubber accounted for 6 percent of agricultural imports. Crude natural rubber now accounts for only 28 percent of total rubber use in the United States compared with nearly 40 percent in the early 1950's.

COCOA BEANS--681 million pounds, valued at \$140 million. Three countries --Ghana, Brazil, and Nigeria--supplied two-thirds of U.S. imports. Cocoa beans equaled 4 percent of agricultural imports. The United States buys one-third of world cocoa bean exports.

CARPET WOOL--185 million pounds valued at \$96 million, mainly from Argentina, New Zealand, Pakistan, Syria, and Iraq. Carpet wool was 3 percent of U.S. agricultural imports.

BANANAS--\$78 million. Main suppliers were Ecuador, Panama, Honduras, Costa Rica. Bananas amounted to 2 percent of all U.S. agricultural imports. The United States buys nearly one-half of world banana exports.



## SUPPLEMENTARY AGRICULTURAL IMPORTS--FISCAL YEAR 1962

SUGAR--4.2 million tons, valued at \$471 million, mainly from Philippines, Peru, Mexico, Dominican Republic, and Brazil. Sugar accounted for 12 percent of U.S. agricultural imports. The United States accounts for almost one-fifth of world sugar imports.

MEATS--Beef, 788 million pounds, valued at \$259 million, mainly from Australia, New Zealand, Ireland, and Argentina; pork, 194 million pounds, valued at \$123 million, mainly from Europe. Meat imports accounted for 5 percent of U.S. meat consumption, 11 percent of total U.S. agricultural imports.

DUTIABLE CATTLE--1.2 million animals, valued at \$108 million, up slightly from the previous year. Drought conditions in both Mexico and Canada forced ranchers and farmers there to ship large numbers of cattle to the United States. Cattle imports were less than 3 percent of U.S. slaughter and only 3 percent of total U.S. agricultural imports.

VEGETABLE OILS AND OILBEARING MATERIALS--Oil equivalent was 1.1 billion pounds, valued at \$151 million, principally from the Philippines, Brazil, Argentina, Republic of the Congo, and Italy. Imports included copra, coconut oil, castor beans and oil, and tung, olive, palm, and palm kernel oils. Imported oils have special characteristics for industry. Imports of oils and oilbearing materials accounted for 8 percent of U.S. vegetable oil consumption, 4 percent of total U.S. agricultural imports.

TOBACCO--165 million pounds, valued at \$109 million. Imports, principally from Greece and Turkey, consisted mainly of oriental types for blending, cigar filler, and scraps. Imports accounted for one-tenth of total U.S. tobacco use, 3 percent of total U.S. agricultural imports.

APPAREL WOOL--167 million pounds, valued at \$109 million, up sharply from the previous year; mainly from Australia, Union of South Africa, Uruguay, and New Zealand. The National Wool Act of 1954 supported prices to encourage domestic production. Domestic output has risen slightly, but lower wool use, and greater use of synthetics, have done more to cut imports. Apparel wool imports account for about two-fifths of U.S. consumption of apparel wool, 3 percent of U.S. agricultural imports.

FRUITS AND FRUIT PREPARATIONS--\$90 million, highest on record, mostly specialized commodities or supplements to offseason production. Main sources were Spain, Mexico, Canada, and the Philippines. Imports equaled 6 percent of U.S. cash receipts from fruit marketings and 2 percent of all agricultural imports.

VEGETABLES AND PREPARATIONS--\$88 million, about one-fourth above the 15-year average. Half were vegetables imported in winter and spring months, principally from Mexico. Imports were equal to 5 percent of U.S. cash receipts from vegetable marketings and 2 percent of all agricultural imports.

GRAINS AND PREPARATIONS--\$55 million, principally barley and feed wheat from Canada. Barley imports were up sharply due to reduced U.S. supplies of malting barley. Wheat and wheat product imports are regulated by quotas. Imports of grains and preparations were 1 percent each of cash receipts from grain marketings and agricultural imports.

DAIRY PRODUCTS--\$54 million, principally cheese from Switzerland, Denmark, the Netherlands, New Zealand, and Italy, and casein from Argentina. Dairy products made up 1 percent of all U.S. agricultural imports. Cheese imports constituted 4 percent of U.S. consumption.

COTTON--158,000 bales, at \$27 million, mainly long staple. Except for short harsh Asiatic cotton, imports are regulated by quotas. Cotton imports, mainly from Egypt and Mexico, were about 1 percent each of U.S. consumption and farm imports.



## CHAPTER V

# INCOME AND COSTS

## *Farm Income* \*

### HIGHEST SINCE 1953

Net farm income has tended to decline from the record high of \$17.3 billion in 1947. Production expenses, which took about half of each dollar of gross income in 1947, now takes over two-thirds of every dollar the farmer receives. In 1962, realized net farm income was \$12.9 billion, \$100 million above 1961 and the highest since 1953. The gain in 1962 resulted from a substantial increase in cash receipts and Government payments which more than offset a continued increase in production expenses.

### PER CAPITA INCOME ALSO HIGHER

Per capita income of the farm population in 1962 was about \$1,430; about \$930 from farm sources and \$500 from nonfarm sources. Nonfarm income is important to farm people. Per capita income in 1962 was about 4 percent higher than in 1961 because of the rise in total farm income and a further decline in farm population.

Per capita income estimates are the result of dividing total personal income of the farm population by the number of people living on farms. A new restrictive definition of "farm" has resulted in a 1963 farm population of some 13.7 million. The use of this new definition is the most important reason why farm per capita income figures appear higher in 1962 than previous years.

Fewer people are sharing national farm income. The farm population's average per capita income was about 60 percent of nonfarm average income, the highest it has been since 1951. Per capita income of nonfarm people in 1962 was \$2,440; of total population, \$2,360.

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\* For details on income, write to Economic Research Service, USDA and ask for Farm Income Situation.

Between 1929 and 1948 farm population was about 22 percent of total population -- farm income was about 8.5 percent of total national income. In 1950 farm people were 15 percent of the population and got 7 percent of the income. By 1960 farm people were 9 percent of the population and got 3.9 percent of the income; in 1962 farm people were 8 percent of the population and got 4 percent of the income.

#### INCOME PER FARM - \$3,500

An easy-to-read yardstick of farm income is average income\* per farm, taking the big with the small, the efficient with the inefficient. Net income per farm in 1962 was \$3,500; in 1960, \$3,000; in 1950, \$2,300. This includes nonmoney income such as "free" rent, garden vegetables, home-slaughtered meat and poultry.

#### INCOME PER HOUR - \$1.05

This was the farm income situation, with particular regard to family farm labor, in 1962:

As a group, farmers and ranchers were near the bottom of the economic ladder. The return from all labor on farms averaged about \$1.05 an hour, compared with \$2.39 in the factory. While farm production per man-hour soared 120 percent since 1947-49, average earnings per hour for farm labor went up only a third by 1960. Annual returns for all farm labor rose from \$1,800 a year in 1947-49 to \$2,400 in 1962.

From 1947-49 to 1962, net farm income dropped 18 percent. Factory output per man-hour went up about a third, hourly earnings rose 83 percent.

As individuals, farmers varied greatly in income from the national averages. Returns also varied by types of farming and crop conditions in different regions of the country.

Here's how farmers' hourly labor return changed from 1947-49 to 1961.

Cash grain farms in the Corn Belt, \$1.55, down 63 cents.

Hog-beef fattening farms in the Corn Belt, \$1.20, down 80 cents.

Cotton farms in the southern Piedmont, 60 cents, up 23 cents.

Cotton farms in the Texas Black Prairie, 59 cents, down 26 cents.

Cotton farms in the Texas High Plains, \$4.91, up \$2.28.

Cotton farms in the irrigated Texas High Plains, \$6.64, up \$2.82.

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\* Net realized



Small tobacco farms, North Carolina, 93 cents, up 33 cents.

Large tobacco-cotton farms, North Carolina, \$1.29, up 47 cents.

Peanut-cotton farms, Southern Coastal Plains, \$1.06, up 47 cents.

Wheat-fallow farms, Washington and Oregon, \$1.87, down \$2.51.

Wheat-pea farms, Washington and Idaho, \$1.47, down \$2.52.

Small grain-livestock farms, Northern Plains, net loss of \$1.15, down \$3.28.

Winter wheat farms, Southern Plains, \$2.52, down 65 cents.

Wheat-grain sorghum farms, Southern Plains, \$3.05, up 84 cents.

Cattle ranches, Northern Plains, 84 cents, down 22 cents.

Cattle ranches, Intermountain region, \$1.62, up 18 cents.

Sheep ranches, Southwest, 9 cents, up 2 cents.

Sheep ranches, Northern Plains, 71 cents, down 21 cents.

#### FARM SIZE AND INCOME

In practically every type of farming, average farm size has increased by more than a third since the late 1930's. Average total investment, in constant dollar values, has increased considerably more. Average size farms, however, have much lower investments than are required for efficient, commercial family farms.

A recent study was made to determine the investment needed to have specified incomes for farm operators' labor and management. The study assumed 1959 cost-price relationships, efficient farming, and 5 percent return for capital invested.

Under these conditions, it was found that the investment required to achieve \$2,500 in operator earnings ranged from about \$26,000 (on a South Carolina Piedmont dairy farm) to more than \$160,000 (for an Oklahoma beef cattle ranch). For operator earnings of \$5,500 in these areas, the estimated investment range was from \$36,000 to \$353,000, respectively.

Hog-beef fattening farms in the Corn Belt needed an average total capital value of more than \$86,000 in 1961, compared with \$51,000 a decade earlier. Studies of central Illinois farms have shown investments above \$130,000 are needed to meet adequate family-size farm requirements. Some family farms in the Illinois studies had investments of more than \$230,000.

Inadequate labor income has encouraged small farm operators to take one of three alternatives: Move to other occupations with more attractive income possibilities; add more land to present farms, as it becomes available; increase family incomes by combining farming with off-farm work. (See Large Credit Needs, page 112.)



## *Parity: Prices Received v. Prices Paid*

### PARTY MEASURES EQUALNESS

Prices of farm goods are only one factor in farmers' well being. The important point is what the farm products will buy -- in terms of food, clothing, medical care, education, feed, machinery, fertilizer, and all the other things the farm family needs for living and producing. The Parity ratio measures the purchasing power of farmers' products in terms of things they buy, as related to the base period 1910-14.

When the parity ratio is 100, farmers are about as well off as they were in 1910-14, so far as the purchasing power of their products is concerned. If the parity ratio is above 100 (that is, the prices-received index is higher than the prices-paid index); farmers' products have a higher purchasing power than in 1910-14. If the parity ratio is below 100, the purchasing power of farm commodities is less than in the base period 1910-14.

The base period, 1910-14, was selected by Congress because farm and nonfarm prices appeared to have been in reasonable balance with one another then. Parity prices are now calculated to maintain this overall balance between prices-received and prices-paid by farmers -- and still permit parity prices for individual products to be in a modern relationship to each other.

A parity-type measure is used on the golf course. When par ("base period" in parity) for the course is 72, then 72 is the reasonable score for that course. When the player makes below par, he is doing fine; as his score rises above par, he is not doing well.

In farming, par is 100 and the ratio is reversed. When the parity ratio is below 100, the farmer's goods buy less than in the base period. When the ratio is 100 or above, the farmer's goods buy more.

### Farmer has less buying power now

Beginning in 1910-14, with a parity ratio of 100, the purchasing power of farm products rose to 120 in 1917, at the time of World War I. By 1932, in the

heart of the depression, the parity ratio plummeted to 58. By 1943, the parity ratio rose to 113, dropped slightly for several years and then reached a new high of 115 in 1947. Since 1947 the parity ratio has trended downward to the 1961 figure of 79, and 80 in 1962.

This means that the bushel of wheat or the quart of milk or the pound of beef (actually, the composite of all these) would buy the farmer 20 percent less of the things he buys now than in 1910-14.

As the bushel of wheat brought about \$2.00 in 1955; thus it took about 22 bushels to buy a man's wool suit with an averaged price of \$43. In 1961, with wheat down to \$1.83 and men's suits up to \$46, the farmer needed 25 bushels of wheat to buy the same suit of clothes.

Milk brought 8.6 cents a quart in 1955 and 9.1 cents in 1961. The price of men's work shoes rose from \$7.10 in 1955 to \$8.60 in 1961. So, where it took 83 quarts of the farmers' milk to buy a pair of shoes in 1955, the same pair of shoes required 94 quarts of milk in 1961.

Corn brought 2.4 cents a pound in 1955, 1.8 cents in 1962; cotton work shirts rose from \$1.92 to \$2.20 in the same period. The corn farmer needed 80 pounds of corn to buy the work shirt in 1955; 122 pounds in 1962.

In using the parity ratio, one must realize its limitations. Parity prices were not designed to measure production-costs-plus-profit. Neither are they prices that will necessarily equalize farm income with nonfarm income.

When we say that farm prices are at more-than-parity (100) we simply mean that the prices-received are in a favorable position compared with prices-paid.



## *Prices Received*

### FARMERS' PRICES FLUCTUATE MORE THAN MOST PRICES

Over the years, farmers' prices tend to swing up and down with the national level of prices, but the swings are more extreme. A good example of this is the drop in farm prices after the Korean War, when prices of nonfarm products continued high. Farmers benefit when the prices they receive go up faster than industrial prices. But, when their prices start downhill faster than factory goods, farmers find their income pinched by the familiar cost-price squeeze.

In the 1930's, farm prices were considerably lower than nonfarm wholesale prices. During the 1940's, farm prices rose faster and stayed higher than nonfarm prices. Since the early 1950's, farm prices have edged down and have been below nonfarm prices since the mid-1950's.

Why are the prices of farm products so unstable compared, for example, with the prices of automobiles, newspapers, or haircuts? Partly it is because there is more price competition in agricultural markets. Millions of farmers compete with one another in selling their products to middlemen, who in turn compete with one another in selling them to consumers. This contrasts with the situation in many manufacturing and service industries, where competition may have little effect upon changes in price from day to day, from month to month, or even from year to year.

Of course, even agricultural markets are not perfectly competitive. Farmers have modified the structure of markets somewhat by setting up cooperative associations. Also, big processors and distributors have come into the picture. Even more important, the Government has taken an active hand in agricultural markets through such mechanisms as crop loans and marketing orders. Even so, competition is still the dominant force in agricultural markets. Cooperative associations, big corporations, and even Government agencies cannot ignore the forces of demand and supply.

Food and fiber are among the most basic wants of all people. When food is scarce consumers will pay very high prices to get as much as they can. On the other hand, when food supplies are very plentiful, prices of farm products may

drop to extremely low levels. This is especially true when there is no way of storing them or diverting them from the regular market channels. Thus, the demand for food is "inelastic with respect to price," as the economists say.

Moreover, prices tend to fluctuate much more at the farm level than at the retail level. This is simply because the cost and charges for marketing and distribution tend to be relatively stable.

Consumer demand is not static--that is, it does not stay fixed from time to time. It is affected by changes in the size and structure of the population, by changes in consumer tastes and habits, and especially by changes in consumer incomes.

Consumers are gradually eating more meats, fruits, and vegetables, and less potatoes and cereal products. These changes are reflected back to the farmer in the prices he receives.

The great increase in the real income of American consumers in the past few decades has been one of the main controlling factors in the market. To some extent, this has raised consumer demand for farm products. But most of the increase in consumer income has gone to buy more manufactured goods and more services. This is because the demands for many of these products are "elastic with respect income"; that is, consumers readily buy more of these products when their incomes go up.

#### Supply of farm products

Generally speaking, a high price for any commodity tends to encourage greater production of it, while a low price tends to discourage production. In World War II, for example, the Congress directed an increase in price supports in order to encourage greater production. Consequently, production increased substantially--especially the output of the supported commodities.

Changes in prices commonly induce farmers to shift from one enterprise to another--e.g. from tobacco to onions, or from dairying to hog production. But big changes in prices are needed to bring about much change in total agricultural output.

Also, it is much easier to expand total agricultural output than it is to reduce it. This is simply because most farmers cannot quickly change their occupations nor their heavy investments in farm land and machinery. Thus, low prices may seldom actually reduce total output of farm products, but they commonly may slow down the rate of growth in agricultural production.

In any case, the high level of our agricultural output is maintained by improved technology--the greatly increased use of machines, fertilizer, and hybrid seeds, for example. New technologies usually tend to lower unit cost of production--but also to increase output. They are profitable to those who



first adopt them. But, in the long run, they commonly expand production and reduce prices. Those who are unable or unwilling to adopt the new methods may be worse off than before.

Along with improved technology has come a big increase in fixed investments in machinery, land, and buildings. The individual farmer is under great pressure to produce as much as he can in order to get some return on his heavy investments. Thus, our main problems in recent years stem from surpluses rather than shortages. While low prices might in time eliminate these surpluses, it would do so at great cost not only to the farmer, but to our whole society. (See Improving Income, page 115.)

### THE INDEX OF PRICES

An index is an indicator, as the index finger is the indicator finger. A price index indicates a measure of prices -- in relation to prices at some other period.

The Index of Prices Received by Farmers is based on 52 important commodities that account for about 92 percent of all farm product receipts. The base period (the period with which present prices are being compared) is usually 1910-14. That period has been determined by Congress to be one of reasonable historical balance between farm and nonfarm prices.

From 1956 to 1962 the index of prices received by farmers rose from 230 to 243, only 6 percent. The index of prices paid by farmers climbed more steeply from 278 to 306 or 10 percent.

Parity, the measure of farmers' buying power, dropped from 83 to 80. Purchasing power of farmers' income dollar had dropped almost 4 percent.

These index numbers are a measure of the relative change in prices. In general, the price relates to the average price for all grades, qualities, and places of sale. The index of prices should be used only to measure changes in price, not changes in farm income or receipts.

Take potatoes as an example. In 1910-14, potatoes sold for \$1.09 a hundred pounds. This is the base price (index of 100). In 1940, the price was 85 cents a hundred; the index dropped to 78 (i.e., the price in 1940 was 78 percent of the 1910-14 price). In 1960, the price was \$2 and the index 183. In January 1963, the price was \$1.54 and the index 141 percent of the 1910-14 price.

### AGRICULTURAL PRICES - 1961

Prices received by farmers climbed to a high in the early 1950's, dropped to a low in the mid 1950's and have about leveled off since then.

Meanwhile, the prices farmers pay for things (personal and production items) have continued to rise. In 1946 the index of prices for farm family living and production was 208. This increased to 306 in 1962.

Farmers have compensated for lower prices by increasing total production and thereby increasing total income. Cash receipts from farm marketings rose to \$35.7 billion in 1962, up from \$30.6 billion in 1956, and \$28.5 billion in 1950.

Here are some average national prices for various commodities farmers sell.

Commodity	1957	1958	1959	1960	1961	1947-49 average
Corn (bushel, or 56 pounds)	\$1.11	\$1.12	\$1.04	\$ .99	\$1.08	\$1.64
Wheat (bushel; 2.3 bushels make 100 lbs. flour)	1.93	1.75	1.76	1.74	1.83	2.14
Oats (bushel; 7.6 bushels make 100 lbs. oatmeal)	.60	.58	.65	.60	.64	.85
Barley (bushel, or 48 pounds)	.89	.90	.86	.84	.98	1.37
Sorghum grain (bushel)	1.74	1.78	1.53	1.49	1.76	2.53
Soybeans (bushel)	2.07	2.00	1.96	2.13	2.28	2.84
Dry beans (pound) (cents)	7.2	6.7	7.0	7.2	7.1	9.9
Potatoes (pound) (cents)	1.9	1.3	2.3	2.0	1.4	2.5
Apples (bushel, or 48 pounds)	1.83	1.87	2.19	2.72	2.42	1.94
Hogs (pound)	17.8	19.6	14.1	15.3	16.6	21.9
Beef cattle (pound)	17.2	21.9	22.6	20.4	20.2	20.2
Lambs (pound)	19.9	21.0	18.7	17.9	15.8	21.9
Broilers (pound)	18.9	18.5	16.1	16.9	13.9	32.1
Turkeys (pound)	23.4	23.9	23.9	25.4	18.9	37.0
Eggs (dozen)	35.9	38.5	31.4	36.0	35.4	46.6
Milk (quart)	9.1	8.9	9.1	9.1	9.1	9.5

Source: 1947-49 average prices from Agricultural Prices, December 15, 1961, all other prices from Agricultural Prices 1961 Annual Summary, June, 1962.



## Prices Paid

Here are some average national prices for various production items that farmers buy:

Commodity	1957	1958	1959	1960	1961	1947-49 (average)
Portland cement (94 pound bag)	\$1.44	\$1.47	\$1.48	\$1.51	\$1.51	\$1.03
Nails (cents per pound for common 8-penny nails)	16.1	16.6	16.9	17.1	17.5	11.0
House paint (gallon)	\$6.25	\$6.36	\$6.33	\$6.34	\$6.42	\$5.23
Tractor (55 horsepower)	N.A.	N.A.	\$5030	\$4990	\$5160	N.A.
Tractor (35 horsepower)	\$2740 (1956)	\$3090	\$3130	\$3070	\$3080	\$2100
Plow, moldboard (2 bottom, 14")	\$266	\$279	\$290	\$300	\$306	\$196
Mower, tractor (7 ft.)	\$366	\$396	\$421	\$434	\$452	N.A.
Combine (self-propelled, 12 ft.)	\$6000	\$6350	\$6560	\$6600	\$6700	\$4310
Farm wagon (less tires and box)	\$177	\$185	\$188	\$190	\$193	\$143
Pitchfork, 3 tine	\$3.35	\$3.55	\$3.86	\$3.93	\$3.98	N.A.
Fertilizer (5-10-5) (ton)	\$45.50	\$45.40	\$45.70	\$46.10	\$47.00	N.A.
Limestone (ton)	\$4.42	\$4.63	\$4.62	\$4.66	\$4.67	N.A.

Source: (Agricultural Prices, 1961 Annual Summary PR 1-3 62, June 1962.)

### SPENDING UP 20 PERCENT

Between 1947-49 and 1961 farmers' production expenditures (including interest, taxes and wage rates) have increased 20 percent. Spending for motor supplies has increased 26 percent; vehicles, 43 percent; farm machinery, 64 percent; farm supplies, 12 percent; building and fencing materials, 32 percent; fertilizer 8 percent; interest rates per acre, 188 percent; taxes per acre, 114 percent.

At the same time, prices paid for family living items have increased 19 percent. Prices of food and tobacco have increased 18 percent; clothing, 20 percent; household operation, 17 percent; house building materials, 21 percent; autos and auto supplies, 37 percent.

## LARGER CREDIT NEEDS

Higher costs, larger farms, more technology and machines, specialization and more long-term capital spending require farmers to borrow more money to continue as commercial producers.

During the past 10 years the number of farms in the U.S. decreased about 30 percent. But in spite of this, capital and credit needs of farmers have been increasing. During these 10 years, the value of livestock, machinery and equipment, crops in storage, and household furnishings on farms has been increasing at about 3 percent a year. Total production expenses have been rising at about 4 percent a year.

Some 64 percent of commercial farmers had outstanding debt in late 1960. The size of farm mortgage loans recorded increased 28 percent between 1959 and 1962. Size of short-term loans from Production Credit Associations increased 25 percent in the same period.

Total farm debt on January 1, 1963, was \$29.3 billion, according to preliminary estimates. This was 6 percent higher than in 1962 and 80 percent higher than 10 years ago. Farm mortgage debt has more than doubled while other farm debt rose about 60 percent.

Despite the marked increase in debt in recent years, on January 1, 1963 farm debt was 14 percent of the value of farm assets, compared with 10 percent in 1950. But in 1950 income was 105 percent of debt; in 1962 income was only 47 percent of debt.

Commercial banks are the most important source of non-real estate credit. On January 1, 1962, they held 46 percent of the \$11.6 billion non-real estate debt (excluding CCC price support loans). Production Credit Associations held 14 percent; Farmers Home Administration held 4 percent. Merchants, dealers and miscellaneous sources held 35 percent.

Insurance Companies and the Federal land banks each held about one fifth of the debt secured by farm real estate on January 1, 1962, and commercial banks held 13 percent. Two fifths of this debt was held by individuals and other miscellaneous lenders.

About 67 percent of farmland purchases required credit-financing in recent years. In 1962, however, this had increased to 71 percent. Not only was a greater proportion of sales credit-financed, but buyers financed a greater part of the purchase price. Continuing a long-established upward trend, average amount of debt was 68 percent of the sale price in March 1962.

The seller was the creditor in 41 percent of the farmland transfers involving credit (1962). Commercial banks supplied loan funds for 15 percent of all credit sales, insurance companies financed 14 percent, Federal Land Banks financed 10 percent, individuals other than sellers financed 7 percent, and "others" (including Farmers Home Administration) financed 11 percent.



Individual sellers required the least down payments. Buyers' equities, already low when financing was supplied by the seller, edged even lower in 1962. Average down payment was only 26 percent of purchase price.

Periodic refinancing of farm mortgage loans provides many farmers a partial solution to high requirements for agricultural capital. Some lenders are experimenting with another device to reduce the amount of equity capital needed by the farm business. Under this plan, only a part of the original loan is paid off, after which the borrower continues to pay interest but does not continue to reduce the principal.

### \$1.5 billion in interest

Highest 1962 interest rate on outstanding farm mortgage debt was in the Southeastern States (5.7 percent) and lowest in the Lake States (4.7 percent). Average farm-mortgage interest rates for the nation as a whole have increased from a low of about 4.4 percent during World War II to 5.1 percent in 1962. Total annual interest charges on this debt have climbed much faster than rates because of the large increase in borrowings. Annual interest charges on farm mortgages were \$272 million in 1942 (26 cents per acre), \$318 million in 1952 (30 cents an acre), and \$735 million in 1962 (72 cents an acre). Annual interest charges on short term farm production debt rose from \$448 million in 1952 to \$720 million 1962. Altogether farmers paid \$1,455 million in interest charges in 1962; \$73 million more than in 1961 and double that of 10 years ago.

### \$3.8 BILLION IN TAXES

Taxes levied on farm real estate totaled \$1.41 billion in 1962, 6 percent above the 1961 total and double the 1950 total of \$741 million. In 1962 State and local tax levies on farm real estate averaged \$1.38 an acre, compared with \$1.30 in 1961 and an average of 62 cents in 1947-49. Taxes per acre in 1961 were 98 cents per \$100 of value, the highest level since World War II. Farm personal property taxes levied in 1962 are estimated at \$303 million, up from \$128 million in 1947.

In 1960 farmers were charged \$173 million in auto license and permit taxes, up from \$97 million in 1947; \$394 million in State and Federal motor fuel taxes, up from \$190 million in 1947. Sales taxes totaled about \$300 million; income taxes paid by farm population amounted to \$1.3 billion.

(For detailed discussion of farm costs and what farmers buy see Technology, page 28.)

The steady rise in farm property taxes during the last 19 years is a direct outgrowth of the steadily expanding needs of local governments. Rural communities, of course, are not alone in this regard. Total taxes paid on nonfarm property, in fact, have risen somewhat more rapidly since World War II

than those paid on farm property. However, new investments in homes, industrial property, and the like have increased substantially, thus providing a much larger tax base, while in agriculture the physical plant, especially land and buildings, has shown relatively slower growth.



## *Improving Income*

Agriculture is the Nation's biggest industry. But, unlike most non-agricultural giants, it is decentralized. No single corporation or group of companies dominates farm production. Also, agriculture's products have little or no identity. Unlike nationally sold manufactured goods, one farmer's corn or wheat is about the same as another farmer's. Farmers don't stick brand labels on their products.

One result of this widespread decentralization and unidentified produce is that the decision of an individual farm operator cannot markedly affect national agricultural production.

The steel industry may operate at 50 or 60 percent of capacity when demand for its product is low. Auto manufacturers try to match production to estimated sales.

State laws require oil producers to restrict production to specific quota. Federal law prohibits shipment of oil in violation of State law.

Farmers generally do not limit production to maintain profits. All the producers of a product must agree to adjust production for the system to have the desired effect. As a result of decentralization, individual commercial family farmers generally increase production regardless of prices. They do this because their unit costs of production will continue about the same or may be lower and their total income increases as production increases. When many commercial family farmers decide to increase income by increasing production, the price structure weakens and they are all back where they started from. This has been the trend in many commodities for the past decade. People eat just so much food. As production increases and prices decrease, demand remains about the same.

An example is staple foods such as bread and potatoes. People will generally not eat more of these if the price drops a few cents. When a man's income doubles, he may buy two cars and a bigger house and more clothes, but he ordinarily will not eat more bread.

See page 108 for discussion of why production continues to increase. Also Food Is A Bargain, page 74.

Economists generally agree that without supports agricultural prices would fall faster than production increases. For a 10 percent increase in production, prices will probably fall 20 or 30 percent.

So, as agriculture has been unable to adjust production as other industry does, and as farm income fluctuates widely and is often low compared with nonfarm income, farmers have tried to better their lot through improved bargaining powers.

Methods that have been developed to provide bargaining strength include: Price support programs; acreage allotments and marketing quotas; marketing orders and agreements; and cooperatives and contract production.

Price supports and Government storage programs have helped farmer bargaining strength and have benefited consumers through stable prices and assuring abundant supplies of high quality foods.

#### THE PRICE SUPPORT PROGRAM

Today's price support program dates back to 1933 after some unsuccessful attempts by the Federal Farm Board and others, during the 1920's. The Commodity Credit Corporation (CCC) first supported prices of corn and cotton. Production loans were made available at harvest time, to permit orderly marketing and greater price stability through the year. The Agricultural Adjustment Act of 1938 made supports mandatory for several crops, and increased the importance of price support in stabilizing farm commodity prices. During two wars, the program encouraged the necessary increased output, by minimizing price risks. Heavy production of many supported crops in recent years has put pressure on market prices, and resulted in greatly expanded support activity.

In 1962, support was mandatory for major crops and livestock products: Wheat, cotton, rice, tobacco, and peanuts (the acreage allotment and marketing quota commodities) and for corn, oats, rye, barley, grain sorghums, tung nuts, honey, milk and butterfat, wool and mohair. Supports were also available for cottonseed, flaxseed, soybeans, dry edible beans, gum naval stores, and surplus almonds.



### How it works\*

Agricultural price support programs are financed by CCC, after approval by the Board of Directors and the Secretary of Agriculture, and are administered by USDA.

Price support operations in the field are a responsibility of State and county Agricultural Stabilization and Conservation (ASC) committees. The committees also administer acreage allotments, marketing quotas, supply adjustment programs for feed grains and wheat, Soil Bank, storage, emergency livestock feed programs, agricultural conservation and the Sugar Act.

Generally located at the county seat, the county office is the farmer's contact for handling most supported commodities. He gets information on program details and help in preparing price support documents and, his eligibility for price supports is determined. Cooperative marketing associations handle some phases of the programs for tobacco, peanuts, gum naval stores, cotton, and soybeans. Dairy price support is handled through purchases from processors by the Minneapolis Commodity Office.

### Four different ways

Prices are supported in four different ways: (1) Loans, (2) purchase agreements, (3) purchases not under purchase agreements, and (4) payments. Loans and purchases are the most important support methods. Of the \$3.3 billion in price support extended on 1961 crops through June 30, 1962, loans accounted for \$2.63 billion (79 percent) and purchases for \$690 million (21 percent).

Loans help the farmer in two major ways: (1) By providing farmers a cash return for the commodity at the support level; and (2) By strengthening prices of the commodity by removing supplies from the market.

The loan program tends to level out marketings. Farmers are usually inclined to market their crops at harvest time which sometimes gluts markets, puts a burden on the transportation system, and lowers prices. The loan program gives farmers an opportunity to obtain a loan at support prices and to hold their crops, without risk, for later marketing. With marketing spread over the season price swings are reduced. If the price fails to rise above the loan level, however, the farmer can deliver his commodity to CCC instead of repaying the loan.

\* Background information on how support programs work for individual commodities is available from the Information Division, Agricultural Stabilization and Conservation Service, USDA.

Purchase agreements are made with CCC through the County ASC office. Producers agree to sell a stipulated quantity of a commodity at the support prices. If market prices, at the time the agreement expires, are less than support, the producer may deliver the quantity at the support price. Agreements were available in 1962 on wheat, rice, corn, tung nuts, tung oil, honey, barley, sorghum grain, oats, rye, soybeans, dry edible beans, peanuts and flaxseed.

Purchases not under purchase agreements. Dairy products are supported by purchases of cheese, butter, and nonfat dry milk from manufacturers and handlers. Fluid milk is purchased for donation to the Armed Forces. Cottonseed may be purchased from producers and ginnerers. Wheat flour and cornmeal are purchased for disposal under certain domestic and foreign purposes. Edible oils (soybean and cottonseed oils) are purchased from processors to help maintain the support level for cottonseed and soybeans.

The payment method of support may be used only for wool, mohair and sugar.

Farmers may not participate

Market prices of some supported commodities may drop below the support level because some farmers do not participate in price-support programs. Farmers may decide not to participate because:

- 1) Adequate storage may be lacking. To obtain a price-support loan, a producer must store in CCC-approved facilities, either privately owned or commercial space. This may not be readily available to some producers.

Others may lack farm storage space and sell at the market price rather than pay storage costs during the loan period.

- 2) Quality may be below that eligible for support or the farmer may not want to risk deterioration and shrinkage in farm storage.
- 3) Quantity of a commodity owned by a producer may not be large enough to encourage participation.
- 4) Inconvenience of paper work involved in a storage loan discourages some farmers.
- 5) They disagree with price support. Some producers do not like supports. If there are many in a marketing area, prices there may be held down by the relatively large volume offered for sale.



- 6) Sales are made by nonfarmers. Only an eligible producer (as landowner, landlord, tenant, or sharecropper) can get price support. At times, large amounts of a commodity may be owned by nonproducers. Their sales of stocks (in a weak or falling market), to minimize or stop their losses, may depress prices even more.

## SECTION 32 PROGRAMS

Surplus removal programs, different from other Department of Agriculture price assistance programs, are carried out under the authority of section 32 of Public Law 320 (74th Congress - 1935).

Section 32 programs provide limited price assistance to farmers; make it possible to find useful outlets for many surplus farm commodities that might otherwise be wasted; and improve the diets of school children and needy persons.

The law requires that section 32 programs be devoted principally to perishable nonbasic commodities. However funds can be used for basic commodities, chiefly to expand export markets.

In deciding which commodities should receive section 32 assistance, the Department of Agriculture also considers these factors:

1. Supply of the commodity in relation to demand.
2. Levels at which prices of other commodities are being supported.
3. Availability of funds.
4. Perishability of the commodity.
5. Importance of the commodity to agriculture and the national economy.
6. Ability to dispose of commodities. (This also means that purchases must be limited to quantities that eligible outlets can use.)
7. Need for offsetting temporary losses of export markets.
8. Ability and willingness of the producers to keep supplies in line with demand. And,

9. Assurances by processors, whenever practicable, that the producers of the commodity involved have received or will receive the maximum benefit from the surplus removal operation.

Section 32 programs have given aid to every segment of the agricultural economy. Products given assistance in recent years include eggs, butter, cheese, nonfat dry milk, turkeys, beef, pork, lamb, dry beans, lard, potatoes and various other vegetables, fruits, cotton and tobacco.

Most of this assistance takes the form of purchases--and donation of the foods to schools, institutions, and the needy. However, some assistance has been given through export and through diversion programs.

Export programs make it possible to sell a product overseas at the competitive world price, even though this may be below the prevailing price in this country. Section 32 funds may be used to pay an exporter a differential, so that he can pay domestic producers at the going rate and still sell the product overseas at a profit.

Diversion programs may take a number of different forms, including the development of new uses and byproducts or diversion to secondary uses. One such program was the development of new date products. Another was for the diversion of potatoes to the manufacture of starch and the feeding of livestock. Section 32 funds are used to reimburse producers (directly or indirectly through processors) for the lower returns they would normally get for selling products for such uses.

In fiscal 1962 \$157 million was spent for removal of surplus agricultural commodities under section 32 programs, compared with \$254 million in 1961 and \$105 million in 1960. \$66 million was spent for direct purchase of chopped meat, \$18 million for turkeys and \$16 million for lard. Total direct purchases amounted to \$131 million; diversion, \$11 million; \$13 million was spent on the Food Stamp Plan.

#### MARKETING AGREEMENT AND ORDER PROGRAMS

Marketing agreements and orders are designed to improve returns to growers through orderly marketing. These are self-help programs through which growers can work together to solve marketing problems they cannot solve individually.

Marketing agreement and order programs now in effect principally affect the marketing of fluid milk and certain fruits, vegetables, and tree nuts.



Fruit and vegetable marketing order programs, an illustration.\* In fiscal 1962 there were 44 marketing order programs in effect covering fruits, vegetables and tree nuts produced in 25 States and having a farm value of \$1.3 billion.

A marketing order may be issued by the Secretary of Agriculture only after a public hearing on the proposed order and after it has been approved by growers voting in a referendum.

Under a fruit and vegetable marketing agreement and order program, an industry can regulate the handling and marketing of its crops to prevent erratic flow to market, reduce the total supply in primary market channels, prevent low quality produce from depressing prices, standardize containers, or prevent unfair trading. These programs also provide a means of financing marketing research and development projects, and the collection of statistics and shipping information needed for effective operation of the program.

Every marketing order program for fruits and vegetables is operated at the local level by an administrative committee made up of growers, or growers and handlers, nominated by the industry and appointed by the Secretary of Agriculture. The principal function of an administrative committee is to recommend regulations to be issued under the marketing order. If these recommendations meet with Department approval, they are issued by the Secretary of Agriculture and become binding upon the whole industry.

Whenever the quality of domestic shipments of certain commodities is regulated under marketing orders, the Secretary of Agriculture must issue import regulations with the same or equivalent requirements.

#### CONTRACT FARMING, VERTICAL INTEGRATION AND ABUNDANCE

The integrated farmer has been defined as one who shares some of the management decisions or risks with one or more related businesses. Contract farming lies between absolute vertical integration (ownership of farm by the business) and loose buying-selling arrangements (between the farmer and another businessman). The farmer can maintain more control when the integrating firm is a cooperative of which he is a member.

In some areas, where farmers get low wage returns and cannot switch to other crops, integrated farming contracts have opened new markets. These contracts allow the contractor to manage the farm for the farmer. The Southeast broiler industry is an example.

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\* Milk marketing orders are another important example.

Commercial broiler production had the fastest growth rate of any major farm product in recent years. Production increased from about 34 million in 1934 to nearly 2 billion broilers in 1961. Gross income grew from \$72 million in 1940 to nearly \$1 billion in 1961.

Most of the increase was in the Southeastern and South Central States. These States produced only 100 million broilers in 1940. In 1961 they produced over 1.6 billion birds. The increase in this region resulted, in part, from underemployment and low-wage rates.

Overall growth of the industry, and the shift of regions, resulted partly from contract production. With contracts, farmers need less money to operate with and carry less risk. Industry growth also resulted from technological improvements that reduced the cost of producing broilers under contract.

The first large-scale commercial broiler producers sold their birds on a cash or open-account basis. Heavy disease losses and price risks discouraged many of them. Production, supply, and marketing activity needed to be coordinated. Feed dealers and broiler processors began to take part of the growers' risks through contract arrangements; their goal was to hold or increase their sales volume, preserve uniform quality, and meet consumers' specifications.

Contracting arrangements have changed over the years. The trend is to provide the farmer a guaranteed minimum return for his labor and investment, even if broiler prices do not cover production costs. Each contract must be analyzed to determine if it provides for both labor and maintenance of the farm.

The industry changed fast as production increased on an integrated basis. Small independent producers almost disappeared. Many smaller feed dealers are no longer in business. Ninety percent of all broilers are produced on about 28,000 farms. Larger, more completely integrated businesses, including some with hatcheries and some with processing plants, spread their production risks with many contract flocks and by increasing the number of company-owned flocks produced with hired labor.

We eat nearly three times as many broilers as we did in 1950 because of low broiler prices, uniform quality, and promotion campaigns. Broiler consumption averaged 25.5 pounds per capita in 1961, only 8.7 pounds in 1950. Despite increased production efficiency, prices have been below direct production costs during much of the past decade.



Broiler production today presents one extreme of farm integration. Fieldmen employed by the contractor do much of the farm management. Farmers reduce their marketing risks and get a guaranteed labor return. Production is concentrated in operations that make fullest use of labor-saving equipment. This equipment can permit lowest per unit cost and high output per man. In some instances, the broiler producer has been relegated to a pieceworker role, especially when the contractor also controls the buildings and equipment. An eventual result of contract production is development of producer bargaining groups. Some evidence of this trend is appearing in the poultry industry now.

#### Contracts that maintain bargaining power

The sugarbeet industry is quite a different example of contract farming integration. All sugarbeet growers in this country have contracts with processors that insure them a market.

Sugarbeets are a heavy, bulky, perishable commodity, whose processing is complex and costly. They are grown under contracts that guarantee a market for growers and a source of beets for processors. Processors and grower bargaining associations negotiate contracts that tie the price of sugarbeets to the price of sugar. The contracts also specify acreage, delivery dates, payment schedules, growers' association dues, seed, growing methods, and marketing practices.

The Government, as required in the Sugar Act, analyzes contracts and determines that prices are fair and reasonable. The Sugar Act also prevents excessive planting, specifies wage standards, and bans child labor. Growers receive Government payments for compliance.

Farmers receive advice on production practices from agriculturists employed by sugar companies. They may also get help in obtaining seasonal labor.

A recent study of sugarbeet production in the Red River Valley showed that 80 percent of the farmers believe they maintain management authority in production. Most of the others, who indicated disagreement with contractor's representatives, said that they (the farmers) make the final decision on their operation.

#### Other examples of integration

There are many other examples of contract farming and vertical integration. Various forms of the arrangements have existed for a long time in the production of commercial fruits and tree nuts.

Vertical integration, including contract farming, accounts for about 90 percent of the vegetables produced for canning and freezing. Probably half the fresh-market vegetables and melons may be produced under various other forms of integration -- principally by grower-shippers.

Variations of vertical integration are many. These range from simple verbal agreements for processing or marketing, to the complete ownership and operation of the farm by business. Contract farming lies between these limits. It is one way for a farmer to share some of his decisions and risks with his supplier, processor, or distributor.

#### MAJOR FORCES IN CHANGE - A NATIONAL MARKET

The trend from a rural, agricultural nation to a predominately city-town-industrial one has brought major changes in farm production. Channeling the food and fiber required by more than 125 million city residents from the farm to the consumer's plate is a vast, complex operation.

National chainstores and others need large amounts of farm goods to satisfy their millions of customers. They need quality and uniformity to back up their sales promotion and advertising. To meet these market needs, merchandisers, processors, farmers (either alone or through their cooperatives), and their suppliers have sought to integrate activities or to contract for production, processing, and marketing.

Farmers' advantages may be reduced marketing risks, a better price, more capital, the only access to a market, or reduced costs of supplies and services. Problems for farmers may include pressure to expand output, the need to reorganize the farm operation to meet the competition of specialized low-cost producers, and the loss of management.

The farmer's ability to maintain his bargaining power in the national market place will depend on competition among contracting firms; cooperatives that can compete and perform a price-setting function; development of farmer bargaining associations; and on his having information on prices and supply and demand conditions.

#### COOPERATIVES

From about 1910 to the 1930's, extensive organization and development of cooperatives took place, often with the help of county agents and farm organizations. Cooperatives have played an important role in improving farmers' bargaining power. These business organizations marketed more than \$9 billion worth of farm products in 1960, almost a quarter of total farm marketings.



Cooperatives provide contract arrangements for their members, thus allowing the farmer a voice in the decision making of the firm with which he contracts.

Cooperatives in the South, for example, contract with farmer-members to produce broilers, turkeys, and eggs. The cooperatives hatch the chicks, mill the feed, provide field supervision, and then process and market the product. In other areas, cooperatives contract with grocers to produce seed and canning crops.

Cooperatives have integrated their own operations to provide more services and increase returns to their members not under contract.

In 1957, farmer cooperatives handled or acted as bargaining agent for almost 60 percent of the fluid milk, 43 percent of the cream, 58 percent of the creamery butter, 23 percent of the cheddar cheese, 74 percent of the nonfat dry milk, and 4 percent of the ice cream sold in this country. Some products, such as California citrus fruits and some tree nuts, are handled in large part by farmer cooperatives.

Cooperatives also provide many vertically integrated services for farmers by buying their production supplies. Cooperatives manufacture practically all the feed, fertilizer, and petroleum fuel they distribute, and they handle about a fifth of all farmers' purchases of these items. Cooperatives also provide wholesaling, transporting and financing services and produce some of the raw materials used, such as seed, crude oil, and phosphate rock.

After all costs of operation are paid, the cooperative distributes the funds left among its members according to their patronage of the association. For both marketing and purchasing cooperatives, it is estimated that patronage refunds amount to over one-quarter billion dollars annually.

#### Volume up, number down

The latest annual survey of farmer cooperatives shows that from June 1959 to July 1960, cooperatives increased in total dollar volume, decreased slightly in memberships, and continued a downward trend in number.

Total gross volume of business amounted to more than \$15.6 billion, representing an increase of 2.7 percent over the previous year. Total net business, excluding intercooperative business, amounted to more than \$12 billion -- an increase of 2.4 percent over the previous year.

Number of memberships decreased 4 percent to 7.3 million (with duplication, as a farmer may belong to two or more cooperatives).

Total number of marketing, farm supply, and related service cooperatives dropped to 9,300 associations, compared with 9,600 in the previous year.

The net marketing volume of \$9.3 billion was up 3 percent over the previous year. It represented 77 percent of the total cooperative business.

The net farm supply volume of more than \$2.4 billion was up 1.6 percent over the previous year. This supply business represented 20 percent of total cooperative volume.

Related services which accounted for nearly 3 percent of the total business of cooperatives, amounted to more than \$298 million -- up 9 percent over the previous year.

- Dairy products continued to rank first in total marketing volume.
- Feed continued in first place among farm production supplies.
- 77 percent of all cooperatives handled one or more farm supplies.
- 71 percent of all cooperatives did some marketing.

Much of the 3 percent decrease in number of associations was the result of continued mergers, consolidations, and acquisitions among cooperatives. Insofar as the emphasis on larger and more efficient business operations continues, a continuing downward trend in number of cooperatives is a reasonable expectation.

A total of 3,770 marketing associations, or 65 percent of the marketing group, handled at least one or more of the major groups of farm production supplies in 1959-60. In addition, 94 associations, predominantly service groups, also handled production supplies for their patrons.

Including the 3,300 associations that actively handled farm supplies in 1959-60, this brought the total number handling farm supplies to 7,100, or 77 percent of the total of 9,300 cooperatives included in the survey.

Together with 5,800 cooperatives classified as marketing cooperatives, 800 farm supply and 9 service associations marketed farm products in 1959-60. This brought the total number marketing farm products to 6,600, or 71 percent of the total number of 9,300 cooperatives in the survey.



### Memberships down

The decrease in total memberships from 7.6 million to 7.3 million is in line with the downward trend since 1955-56, a trend that has been attributed to the decline in total number of farmers.

These membership figures contain duplication, as many farmers are members of more than one cooperative and may be counted more than once. It is not possible to eliminate this duplication under current reporting methods.

### Marketing

The gross value of all farm products marketed by farmer cooperatives in 1959-60, including intercooperative business, amounted to \$11.6 billion. The net value, excluding interassociation business, amounted to \$9.3 billion. This is an increase of nearly 3 percent over 1958-59. Increases in the dollar volumes reported for cotton products, dairy products, fruits and vegetables, grain, rice, and tobacco largely contributed to this increase.

Dairy products continued in first place in the value of farm products marketed by cooperatives, with a net value -- excluding intercooperative business -- of more than \$3 billion. This was an increase of 2.8 percent over the net volume in 1958-59. Dairy products accounted for 33 percent of the net value of all farm products marketed by farmer cooperatives in 1959-60.

Grain, including soybeans and soybean products, remained in second place. The net value of grain handled by cooperatives amounted to \$1.93 billion -- an increase of 1.8 percent over the previous year. This commodity group accounted for almost 21 percent of the total net value of all farm products marketed by cooperatives in 1959-60.

Although livestock and livestock products showed a decrease from the previous year, this commodity group remained in third place with a net value of \$1.47 billion, a 4 percent decrease from the previous year. Livestock and livestock products accounted for 16 percent of the total net value of all farm products marketed by cooperatives in 1959-60. Lower hog prices appeared to be a major factor in the decrease in value of livestock handled.

### Farm supplies

The gross value of all production supplies handled by farmer cooperatives in 1959-60 was \$3.7 billion. The net value amounted to \$2.4 billion, an increase of 1.6 percent.

Feed continued in first place in the supply group, with a net value of almost \$886 million -- down 1 percent from the previous year. Feed accounted for 36.8 percent of the total net value of all farm supplies handled.

Petroleum products held second place among farm supplies with a net value of \$596 million, up 2.8 percent over the previous year. In 1959-60 petroleum products accounted for almost 25 percent of the total net value of farm production supplies handled by cooperatives.

Fertilizer retained third place with a net value of \$334 million, up 6 percent compared with the previous year. It accounted for 14 percent of the net value of all production supplies handled.

Other supplies, totaling \$555 million, included seed, pesticides, building supplies, machinery, containers, food, and general farm supplies.

#### Related services

More than 5,500 cooperatives performed services related to marketing and farm supply operations -- such as trucking, storage, ginning, drying, grinding, spraying, and similar services -- 60 percent of the total number of associations.

The 220 cooperatives specifically classified as related service cooperatives did not include credit, electric, dairy herd improvement, artificial breeding, or production types of cooperatives.

Total receipts for services continued to increase. In 1959-60 these service receipts amounted to \$298 million, compared with \$273 million in the previous year -- an increase of 9 percent. This upward trend in service receipts reflects the increasing diversification in the operations of cooperatives to serve the needs of their farmer-patrons.

Most other kinds of cooperatives have shown the same trend as the marketing and supply associations, and have increased business volume.

On January 1, 1962, there were 779 Federal Land Bank associations with 380,000 members; 487 Production Credit Associations with 519,000 members; 790 rural credit unions with 235,000 members; 1,436 dairy herd improvement associations with 42,000 members; 47 dairy cattle artificial breeding associations with 675,000 members.

Also, in 1961, there were 13 Banks for Cooperatives serving 3.7 million participants; 211 Rural Electrification Administration telephone cooperatives serving 472,000 members; and 910 rural electric cooperatives with 4.6 million members.



In 1960, there were 19 rural health cooperatives with 66,000 members, and an estimated 1,600 farmers' mutual fire insurance companies with 3 million members.

In 1959, there were 7,700 mutual irrigation companies with 162,000 members.

It is important to realize that the leading farmer cooperatives, although substantial in size, are still relatively small compared with major non-cooperative firms that deal in farm supplies or farm products.

While there are fewer cooperatives, they are now appreciably larger, both in number of members and in volume of business. Farmers' ownership interest in farmer cooperatives of all kinds, including electric, credit, insurance, and other types of service cooperatives has grown from \$2 billion in 1950 to \$4.5 billion in 1962. The increase in ownership interest in marketing and purchasing associations alone has been from \$1.1 billion to \$2.3 billion in these same years.

## HIGHLIGHTS OF 1962

Combined production of all crops was about the same in 1962 as in 1961 and 1960, despite a 3 percent smaller crop acreage, the smallest acreage in modern times. Average yield per acre was the highest on record. Compared with 1960, production food and feed grains was lower, but this was offset by increases in all other groups of crops. Yield of all crops was up 4 percent from 1961, and is expected to continue rising.

Total production of wheat and feed grains was somewhat lower. This, combined with continued high use, has resulted in a reduction in wheat stocks of 100 million bushels for the second year in a row.

Feed grain production was also smaller than 1960, in spite of higher acre yields. Smaller production and heavier feeding are expected to cause a 1 billion bushel decrease in feed grain supplies over a 2 year period.

The 1962 Annual Summary of vegetable production shows that 213 million hundredweight were produced in 1962, slightly less than last year, but 4 percent above average. Record tonnages of sweet corn and cantaloups were produced in 1962. Production of the 10 principal vegetable crops for commercial processing in 1962 reached a new record of 9.2 million tons, 13 percent above 1961.

The 143 million tons of corn and other feed grains which farmers produced in 1962 (2 percent above 1961) can be translated into an average of 160 pounds of red meat, 30 pounds of chicken, 7 pounds of turkey, 27 dozen eggs, and 640 pounds of milk for each man, woman, and child in the United States.

Family Farms -- Although the number of farms continues to drop at a rate of more than 100,000 per year, the "adequate" family farm is more than holding its own. "Adequate", in this case, means a farm that sells at least \$10,000 worth of products per year. In the last decade, the number of these farms has increased by 64 percent, while the number of smaller farms has decreased by about 42 percent; the percentage of farms using more hired labor than family labor also decreased.

Food Marketing Charges Level Off -- Food marketing charges leveled off after a continued rise for eleven years in a row. Marketing charges are expected to be about the same in 1963. Marketing costs about 62 cents for each dollar we spend for food -- a total of \$42 billion in 1962. The farmer continued to receive 38 cents of each farm food dollar.

Farm Income Net farm income in 1962 was -- \$12.9 billion, about \$3,500 per farm, compared with \$12.8 billion and \$3,400 per farm in 1961.



# Appendix 1

## SUMMARIES OF STATE AGRICULTURE\*

ALABAMA had 109,000 farms in 1962, of which about 50 percent were commercial. Average farm size was 152 acres. The State had a total of 16.6 million farmland acres, about 51 percent of total land area. Average value of farm land and buildings was \$16,500. Farm marketings in 1962 were \$538 million; \$327 million from livestock, \$211 million from crops. Average gross income per farm was \$5,851, net income per farm was \$2,026. Total cash receipts from farming were \$560 million.

Leading farm commodities in 1961 were: Cotton lint, \$104 million; broilers, \$88 million; and cattle, \$85 million.

ALASKA had 400 farms in 1962, of which about 50 percent were commercial. Average farm size was 2,250 acres. The State had a total of 900,000 farmland acres, or about 0.2 percent of total land area. Average value of farm land and buildings was about \$55,000. Farm marketings in 1962 were \$4 million; \$3 million from livestock, \$1 million from crops.

Leading farm commodities in 1960 were: Milk, \$2.1 million; potatoes, \$700,000 and eggs, \$500,000.

ARIZONA had 7,600 farms in 1962, of which about 70 percent were commercial. Average farm size was 5,900 acres. The State had a total of 45 million farmland acres, or about 55 percent of total land area. Average value of farm land and buildings was \$326,000. Farm marketings in 1962 were \$507 million; \$182 million from livestock, \$325 million from crops. Average gross income per farm was \$69,000, net income per farm was \$24,000. Total cash receipts from farming were \$513 million.

Leading farm commodities in 1961 were: Cotton, \$143 million; cattle, \$141 million; and lettuce, \$36 million.

ARKANSAS had 90,000 farms in 1962, of which about 55 percent were commercial. Average farm size was 194 acres. The State had a total of 17.5 million farmland acres, or about 49.0 percent of total land areas. Average value of farm land and buildings was \$24,400. Farm marketings in 1962 were \$778 million; \$283 million from livestock, \$495 million from crops. Average gross income per farm was \$9,580, net income per farm was \$3,745. Total cash receipts from farming were \$794 million.

Leading farm commodities in 1961 were: Cotton lint, \$243 million; soybeans, \$121 million; and broilers, \$95 million.

\* Data on number of farms, average size, and total farmland acres for 1962 are from USDA and not comparable to 1959 Census data. The count on number of farms was about 8 percent short in the 1959 Census of Agriculture. Also, Census figures did not include farms which were wholly in the Soil Bank in 1959 and which reported no sales.

CALIFORNIA had 102,000 farms in 1962, of which about 67 percent were commercial. Average farm size was 380 acres. The State had a total of 39 million farmland acres, or about 37 percent of total land area. Average value of farm land and buildings was \$163,000. Farm marketings in 1962 were \$3.3 billion; \$1.3 billion from livestock, \$2 billion from crops. Average gross income per farm was \$34,000, net income per farm was \$9,638.

Leading farm commodities in 1961 were: cattle, \$538 million; milk, \$391 million; and cotton lint, \$291 million.

COLORADO had 35,000 farms in 1962, of which about 78 percent were commercial. Average farm size was 1,200 acres. The State had a total of 41 million farmland acres, or about 58 percent of total land area. Average value of farm land and buildings was \$70,900. Farm marketings in 1962 were \$625 million: \$414 million from livestock, \$211 million from crops. Average gross income per farm was \$20,000, net income per farm was \$3,528. Total cash receipts from farming were \$665 million.

Leading farm commodities in 1961 were: Cattle, \$321 million; wheat, \$96 million; and milk, \$31 million.

CONNECTICUT had 8,500 farms in 1962, of which about 65 percent were commercial. Average farm size was about 124 acres. The State had a million farmland acres, or about 28 percent of total land area. Average value of farm land and buildings was \$57,000. Farm marketings in 1962 were \$143 million; \$93 million from livestock, \$50 million from crops. Average gross income per farm was \$18,700, net income per farm was \$3,814. Total cash receipts from farming were \$144 million.

Leading farm commodities in 1961 were: Milk, \$43 million; eggs, \$27 million; and tobacco, \$18 million.

DELAWARE had 5,400 farms in 1962, of which about 75 percent were commercial. Average farm size was about 144 acres. The State had a total of 800,000 farmland acres, or about 60 percent of total land area. Average value of farm land and buildings was \$38,900. Farm marketings in 1962 were \$102 million; \$68 million from livestock, \$34 million from crops. Average gross income per farm was \$20,700, net income per farm was \$4,158. Total cash receipts from farming were \$104 million.

Leading farm commodities in 1961 were: Broilers, \$49 million; soybeans, \$11 million; and corn, \$9 million.

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\* See footnote on page 131.



FLORIDA had 47,000 farms in 1962, of which about 52 percent were commercial. Average farm size was 360 acres. The State had a total of 17 million farm-land acres, or about 44 percent of total land area. Average value of farm land and buildings was \$94,000. Farm marketings in 1962 were \$837 million; \$215 million from livestock, \$622 million from crops. Average gross income per farm was \$18,800, net income per farm was \$7,957. Total cash receipts from farming were \$847 million.

Leading farm commodities in 1961 were: Oranges, \$298 million; milk, \$85 million; and cattle, \$64 million.

GEORGIA had 100,000 farms in 1962, of which about 58 percent were commercial. Average farm size was 210 acres. The State had a total of 21 million farm-land acres, or about 53 percent of total land area. Average value of farm land and buildings was \$24,300. Farm marketings in 1962 were \$757 million; \$425 million from livestock, \$332 million from crops. Average gross income per farm was \$8,700, net income per farm was \$2,433. Total cash receipts from farming were \$791 million.

Leading farm commodities in 1961 were: Broilers, \$156 million; cotton lint, \$86 million; and eggs, \$86 million.

HAWAII had 6,800 farms in 1962, of which about 47 percent were commercial. Average farm size was 380 acres. The State had a total of 2.6 million farm-land acres, or about 60 percent of total land area. Farm marketings in 1962 were \$283 million; \$32 million from livestock, \$251 million from crops. Leading farm commodities in 1961 were: Sugar products, \$127 million; pineapple products, \$113 million; and beef cattle, \$9 million.

IDAHO had 36,500 farms in 1962, of which about 76 percent were commercial. Average farm size was 420 acres. The State had a total of 15 million farm-land acres, or about 29 percent of total land area. Average value of farm land and buildings was \$54,000. Farm marketings in 1962 were \$450 million; \$203 million from livestock, \$247 million from crops. Average gross income per farm was \$13,700, net income per farm was \$3,813. Total cash receipts from farming were \$473 million.

Leading farm commodities in 1961 were: Cattle, \$100 million; potatoes, \$65 million; and wheat, \$59 million.

ILLINOIS had 151,000 farms in 1962, of which about 80 percent were commercial. Average farm size was 202 acres. The State had a total of 31 million farmland acres, or about 85 percent of total land area. Average value of farm land and buildings was \$66,900. Farm marketings in 1962 were \$2.2 billion; \$1.2 billion from livestock, \$1 billion from crops. Average gross income per farm was \$16,300, net income per farm was \$5,185. Total cash receipts from farming were \$2.3 billion.

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\* See footnote on page 131.



Leading farm commodities in 1961 were: Cattle, \$425 million; hogs, \$461 million; and corn, \$417 million.

INDIANA had 126,000 farms in 1962, of which about 65 percent were commercial. Average farm size was 152 acres. The State had a total of 19.2 million farmland acres, or about 80 percent of total land area. Average value of farm land and buildings was \$41,500. Farm marketings in 1962 were \$1.2 billion; \$727 million from livestock, \$481 million from crops. Average gross income per farm was \$11,200, net income per farm was \$3,820. Total cash receipts from farming were \$1.3 billion.

Leading farm commodities in 1961 were: Hogs, \$305 million; cattle, \$179 million; and soybeans, \$168 million.

IOWA had 178,000 farms in 1962, of which about 88 percent were commercial. Average farm size was about 195 acres. The State had a total of 35 million farmland acres, or about 94 percent of total land area. Average value of farm land and buildings was \$50,000. Farm marketings in 1962 were \$2.6 billion; \$2 billion from livestock, \$591 million from crops. Average gross income per farm was \$16,000, net income per farm was \$4,561. Total cash receipts from farming were \$2.8 billion.

Leading farm commodities in 1961 were: Cattle, \$856 million; hogs, \$733 million; and corn, \$318 million.

KANSAS had 105,000 farms in 1962, of which about 80 percent were commercial. Average farm size was 477 acres. The State had a total of 50 million farmland acres, or about 96 percent of total land area. Average value of farm land and buildings was \$55,900. Farm marketings in 1962 were \$1.3 billion; \$683 million from livestock, \$603 million from crops. Average gross income per farm was \$13,900, net income per farm was \$3,907. Total cash receipts from farming were \$1.4 billion.

Leading farm commodities in 1961 were: Cattle, \$498 million; wheat, \$486 million; and hogs, \$71 million.

KENTUCKY had 150,000 farms in 1962, of which about 57 percent were commercial. Average farm size was 118 acres. The State had a total of 18 million farmland acres, or about 67 percent of total land area. Average value of farm land and buildings was \$18,706. Farm marketings in 1962 were \$621 million; \$310 million from livestock, \$311 million from crops. Average gross income per farm was \$5,111, net income per farm was \$2,290. Total cash receipts from farming were \$656 million.

Leading farm commodities in 1961 were: Tobacco, \$272 million; cattle, \$107 million; and milk, \$89 million.

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\* See footnote on page 131.



LOUISIANA had 74,000 farms in 1962, of which about 47 percent were commercial. Average farm size was 143 acres. The State had a total of 11 million farmland acres, or about 36 percent of total land area. Average value of farm land and buildings was \$28,200. Farm marketings in 1962 were \$430 million; \$165 million from livestock, \$265 million from crops. Average gross income per farm was \$6,768, net income per farm was \$2,723. Total cash receipts from farming were \$449 million.

Leading farm commodities in 1961 were: Cattle, \$76 million; cotton lint, \$75 million; and rice, \$67 million.

MAINE had 17,700 farms in 1962, of which about 56 percent were commercial. Average farm size was 186 acres. The State had a total of 3.3 million farmland acres, or about 16 percent of total land area. Average value of farm land and buildings was \$17,900. Farm marketings in 1962 were \$185 million; \$121 million from livestock, \$64 million from crops. Average gross income per farm was \$11,521, net income per farm was \$2,415. Total cash receipts from farming were \$187 million. Leading farm crop in 1961 was potatoes, valued at \$38 million.

MARYLAND had 25,600 farms in 1962, of which about 64 percent were commercial. Average farm size was 142 acres. The State had a total of 3.6 million farmland acres, or about 55 percent of total land area. Average value of farm land and buildings was \$46,870. Farm marketings in 1962 were \$283 million; \$187 million from livestock, \$96 million from crops. Average gross income per farm was \$12,913, net income per farm was \$2,975. Total cash receipts from farming were \$290 million.

Leading farm commodities in 1961 were: Milk, \$73 million; broilers, \$59 million; and cattle, \$29 million.

MASSACHUSETTS had 11,700 farms in 1962, of which about 64 percent were commercial. Average farm size was 103 acres. The State had a total of 1.2 million farmland acres, or about 23 percent of total land area. Average value of farm land and buildings was \$39,739. Farm marketings in 1962 were \$156 million; \$96 million from livestock, \$60 million from crops. Average gross income per farm was \$14,707, net income per farm was \$2,769. Total cash receipts from farming were \$156 million.

Leading farm commodities in 1961 were: Milk, \$46 million; eggs, \$25 million; and apples, \$7 million.

MICHIGAN had 111,000 farms in 1962, of which about 58 percent were commercial. Average farm size was 133 acres. The State had a total of 14.8 million farmland acres, or about 41 percent of total land area. Average value of farm land and buildings was \$29,043. Farm marketings in 1962 were \$739 million; \$400 million from livestock, \$339 million from crops. Average gross income per farm was \$8,146, net income per farm was \$2,541. Total cash receipts from farming were \$785 million.

\* See footnote on page 131.

Leading farm commodities in 1961 were Milk, \$205 million; cattle, \$85 million; and wheat, \$60 million.

MINNESOTA had 152,000 farms in 1962, of which about 83 percent were commercial. Average farm size was about 213 acres. The State had a total of 32.4 million farmland acres, or about 60 percent of total land area. Average value of farm land and buildings was \$34,548. Farm marketings in 1962 were \$1.5 billion; \$1.1 billion from livestock, \$411 million from crops. Average gross income per farm was \$11,189, net income per farm was \$3,465. Total cash receipts from farming were \$1.6 billion.

Leading farm commodities in 1961 were: Cattle, \$336 million; milk, \$306 million; and hogs, \$231 million.

MISSISSIPPI had 125,000 farms in 1962, of which about 53 percent were commercial. Average farm size was 154 acres. The State had a total of 19 million farmland acres, or about 62 percent of total land area. Average value of farm land and buildings was \$19,880. Farm marketings in 1962 were \$697 million; \$281 million from livestock, \$416 million from crops. Average gross income per farm was \$6,357, net income per farm was \$2,473. Total cash receipts from farming were \$715 million.

Leading farm commodities in 1961 were: Cotton lint, \$274 million; cattle, \$97 million; and broilers, \$58 million.

MISSOURI had 170,000 farms in 1962, of which about 63 percent were commercial. Average farm size was 203 acres. The State had a total of 36 million farmland acres, or about 75 percent of total land area. Average value of farm land and buildings was \$25,400. Farm marketings in 1962 were \$1.2 billion; \$750 million from livestock, \$382 million from crops. Average gross income per farm was \$8,111, net income per farm was \$2,920.

Leading farm commodities in 1961 were: Cattle, \$287 million; hogs, \$227 million; and soybeans, \$144 million.

MONTANA had 31,200 farms in 1962, of which about 81 percent were commercial. Average farm size was 2,141 acres. The State had a total of 67 million farmland acres, or about 69 percent of total land area. Average value of farm land and buildings was \$85,000. Farm marketings in 1962 were \$428 million; \$243 million from livestock, \$185 million from crops. Average gross income per farm was \$15,417, net income per farm was \$5,592. Total cash receipts from farming were \$454 million.

Leading farm commodities in 1961 were: Cattle, \$166 million; wheat, \$104 million; and barley, \$17 million.

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\* See footnote on page 131.



NEBRASKA had 88,000 farms in 1962, of which about 89 percent were commercial. Average farm size was 548 acres. The State had a total of 48 million farm-land acres, or about 97 percent of total land area. Average value of farm land and buildings was \$53,589. Farm marketings in 1962 were \$1.3 billion; \$827 million from livestock, \$426 million from crops. Average gross income per farm was \$16,087, net income per farm was \$4,287. Total cash receipts from farming were \$1.4 billion.

Leading farm commodities in 1961 were: Cattle, \$526 million; corn, \$198 million; and hogs, \$153 million.

NEVADA had 2,400 farms in 1962, of which about 69 percent were commercial. Average farm size was 3,625 acres. The State had a total of 8.7 million farm-land acres, or about 16 percent of total land area. Average value of farm land and buildings was \$170,410. Farm marketings in 1962 were \$46 million; \$39 million from livestock, \$7 million from crops. Average gross income per farm was \$21,070, net income per farm was \$3,741. Total cash receipts from farming were \$47 million.

Leading farm commodities in 1961 were: Cattle, \$27 million; milk, \$5 million; and hay, \$2 million.

NEW HAMPSHIRE had 6,200 farms in 1962, of which about 52 percent were commercial. Average farm size was 192 acres. The State had a total of 1.2 million farmland acres, or about 20 percent of total land area. Average value of farm land and buildings was \$23,197. Farm marketings in 1962 were \$55 million; \$44 million from livestock, \$11 million from crops. Average gross income per farm was \$10,135, net income per farm was \$1,996.

Leading farm commodities in 1961 were: Milk, \$21 million; eggs, \$13 million; and broilers, \$3 million.

NEW JERSEY had 14,600 farms in 1962, of which about 76 percent were commercial. Average farm size was 97 acres. The State had a total of 1.4 million farm-land acres, or about 29 percent of total land area. Average value of farm land and buildings was \$56,809. Farm marketings in 1962 were \$285 million; \$151 million from livestock, \$134 million from crops. Average gross income per farm was \$22,257, net income per farm was \$5,485. Total cash receipts from farming were \$290 million.

Leading farm commodities in 1961 were: Eggs, \$66 million; milk, \$63 million; and tomatoes, \$16 million.

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\* See footnote on page 131.

NEW MEXICO had 16,700 farms in 1962, of which about 62 percent were commercial. Average farm size was 3,102 acres. The State had a total of 52 million farmland acres, or about 60 percent of total land area. Average value of farm land and buildings was \$81,415. Farm marketings in 1962 were \$265 million; \$155 million from livestock, \$110 million from crops. Average gross income per farm was \$17,442, net income per farm was \$5,547. Total cash receipts from farming were \$280 million.

Leading farm commodities in 1961 were: Cattle, \$121 million; cotton lint, \$40 million; and milk, \$12 million.

NEW YORK had 80,000 farms in 1962, of which about 69 percent were commercial. Average farm size was 174 acres. The State had a total of 14 million farmland acres, or about 44 percent of total land area. Average value of farm land and buildings was \$27,737. Farm marketings in 1962 were \$852 million; \$609 million from livestock, \$243 million from crops. Average gross income per farm was \$12,558, net income per farm was \$3,162. Total cash receipts from farming were \$873 million.

Leading farm commodities in 1961 were: Milk, \$453 million; cattle, \$63 million; and eggs, \$57 million.

NORTH CAROLINA had 200,000 farms in 1962, of which about 63 percent were commercial. Average farm size was 87 acres. The State had a total of 17.4 million farmland acres, or about 51 percent of total land area. Average value of farm land and buildings was \$19,111. Farm marketings in 1962 were \$1.1 billion; \$328 million from livestock, \$788 million from crops. Average gross income per farm was \$6,589, net income per farm was \$3,059. Total cash receipts from farming were \$1.2 billion.

Leading farm commodities in 1961 were: Tobacco, \$556 million; broilers, \$82 million; and milk, \$69 million.

NORTH DAKOTA had 53,000 farms in 1962, of which about 92 percent were commercial. Average farm size was 794 acres. The State had a total of 42 million farmland acres, or about 93 percent of total land area. Average value of farm land and buildings was \$50,624. Farm marketings in 1962 were \$614 million; \$222 million from livestock, \$392 million from crops. Average gross income per farm was \$13,572, net income per farm was \$4,902. Total cash receipts from farming were \$687 million.

Leading farm commodities in 1961 were: Wheat, \$186 million; cattle, \$126 million; and barley, \$34 million.

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\* See footnote on page 131.



OHIO had 139,000 farms in 1962, of which about 61 percent were commercial. Average farm size was 135 acres. The State had a total of 18.8 million farm-land acres, or about 71 percent of total land area. Average value of farm land and buildings was \$35,976. Farm marketings in 1962 were over \$1 billion; \$644 million from livestock, \$399 million from crops. Average gross income per farm was \$9,020, net income per farm was \$2,763. Total cash receipts from farming were \$1.1 billion.

Leading farm commodities in 1961 were: Milk, \$220 million; cattle, \$156 million; and hogs, \$152 million.

OKLAHOMA had 95,000 farms in 1962, of which about 60 percent were commercial. Average farm size was 394 acres. The State had a total of 37 million farm-land acres, or about 81 percent of total land area. Average value of farm land and buildings was \$39,327. Farm marketings in 1962 were \$646 million; \$377 million from livestock, \$269 million from crops. Average gross income per farm was \$7,911, net income per farm was \$2,253. Total cash receipts from farming were \$702 million.

Leading farm commodities in 1961 were: Cattle, \$261 million; wheat, \$177 million; and cotton lint, \$55 million.

OREGON had 45,500 farms in 1962, of which about 54 percent were commercial. Average farm size was 466 acres. The State had a total of 21 million farm-land acres, or about 35 percent of total land area. Average value of farm land and buildings was \$51,127. Farm marketings in 1962 were \$430 million; \$199 million from livestock, \$231 million from crops. Average gross income per farm was \$10,746, net income per farm was \$2,858. Total cash receipts from farming were \$445 million.

Leading farm commodities in 1961 were: Cattle, \$87 million; milk, \$45 million; and wheat, \$41 million.

PENNSYLVANIA had 96,000 farms in 1962, of which about 59 percent were commercial. Average farm size was about 124 acres. The State had a total of 12 million farmland acres, or about 41 percent of total land area. Average value of farm land and buildings was \$27,144. Farm marketings in 1962 were \$799 million; \$580 million from livestock, \$219 million from crops. Average gross income per farm was \$9,833, net income per farm was \$2,515. Total cash receipts from farming were \$819 million.

Leading farm commodities in 1961 were: Milk, \$312 million; eggs, \$108 million; and cattle, \$89 million.

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\* See footnote on page 131.

RHODE ISLAND had 1,400 farms in 1962, of which about 78 percent were commercial. Average farm size was 96 acres. The State had a total of 100,000 farmland acres, or about 20 percent of total land area. Average value of farm land and buildings was \$48,764. Farm marketings in 1962 were \$23 million; \$15 million from livestock, \$8 million from crops. Average gross income per farm was \$18,221, net income per farm was \$3,481.

Leading farm commodities in 1961 were: Milk, \$8 million; eggs, \$3 million; and potatoes, \$3 million.

SOUTH CAROLINA had 77,000 farms in 1962, of which about 54 percent were commercial. Average farm size was 126 acres. The State had a total of 9.7 million farmland acres, or about 47 percent of total land area. Average value of farm land and buildings was \$20,136. Farm marketings in 1962 were \$389 million; \$110 million from livestock, \$279 million from crops. Average gross income per farm was \$5,995, net income per farm was \$2,374. Total cash receipts from farming were \$410 million.

Leading farm commodities in 1961 were: Tobacco, \$100 million; cotton lint, \$67 million; and soybeans, \$27 million.

SOUTH DAKOTA had 56,200 farms in 1962, of which about 89 percent were commercial. Average farm size was 804 acres. The State had a total of 45 million farmland acres, or about 92 percent of total land area. Average value of farm land and buildings was \$46,620. Farm marketings in 1962 were \$679 million; \$517 million from livestock, \$162 million from crops. Average gross income per farm was \$13,623, net income per farm was \$4,854. Total cash receipts from farming were \$733 million.

Leading farm commodities in 1961 were: Cattle, \$277 million; hogs, \$105 million; and wheat, \$76 million.

TENNESSEE had 159,000 farms in 1962, of which about 52 percent were commercial. Average farm size was 103 acres. The State had a total of 16 million farmland acres, or about 60 percent of total land area. Average value of farm land and buildings was \$16,204. Farm marketings in 1962 were \$522 million; \$276 million from livestock, \$246 million from crops. Average gross income per farm was \$4,148, net income per farm was \$1,639. Total cash receipts from farming were \$552 million.

Leading commodities in 1961 were: Cotton lint, \$93 million; cattle, \$90 million; and tobacco, \$90 million.

TEXAS had 224,000 farms in 1962, of which about 61 percent were commercial. Average farm size was about 688 acres. The State had a total of 154 million farmland acres, or about 85 percent of total land area. Average value of farm land and buildings was \$64,950. Farm marketings in 1962 were more

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\* See footnote on page 131.



than \$2.5 billion; \$1.1 billion from livestock, \$1.4 billion from crops. Average gross income per farm was \$12,088, net income per farm was \$3,870. Total cash receipts from farming were \$2.6 billion.

Leading farm commodities in 1961 were: Cattle, \$646 million; cotton lint, \$644 million; and grain sorghum, \$207 million.

UTAH had 17,400 farms in 1962, of which about 61 percent were commercial. Average farm size was 782 acres. The State had a total of 13.6 million farmland acres, or about 24 percent of total land area. Average value of farm land and buildings was \$51,038. Farm marketings in 1962 were \$166 million; \$127 million from livestock, \$39 million from crops. Average gross income per farm was \$10,722, net income per farm was \$2,784. Total cash receipts from farming were \$174 million.

Leading commodities in 1961 were: Cattle, \$44 million; milk, \$30 million; and turkeys, \$14 million.

VERMONT had 12,400 farms in 1962, of which about 75 percent were commercial. Average farm size was about 252 acres. The State had a total of 3.1 million farmland acres, or about 50 percent of total land area. Average value of farm land and buildings was \$23,335. Farm marketings in 1962 were \$125 million; \$111 million from livestock, \$14 million from crops. Average gross income per farm was \$11,380, net income per farm was \$2,371. Total cash receipts from farming were \$127 million.

Leading farm commodities in 1961 were: Milk, \$94 million; cattle, \$10 million; and eggs, \$5 million.

VIRGINIA had 96,000 farms in 1962, of which about 51 percent were commercial. Average farm size was 139 acres. The State had a total of 13.3 million farmland acres, or about 52 percent of total land area. Average value of farm land and buildings was \$23,565. Farm marketings in 1962 were \$498 million; \$255 million from livestock, \$243 million from crops. Average gross income per farm was \$6,543, net income per farm was \$2,310. Total cash receipts from farming were \$515 million.

Leading farm commodities in 1961 were: Tobacco, \$92 million; milk, \$82 million; and cattle, \$66 million.

WASHINGTON had 54,000 farms in 1962, of which about 55 percent were commercial. Average farm size was about 337 acres. The State had a total of 18.2 million farmland acres, or about 44 percent of total land area. Average value of farm land and buildings was \$52,731. Farm marketings in 1962 were \$576 million; \$214 million from livestock, \$362 million from crops. Average gross income per farm was \$12,031, net income per farm was \$3,715. Total cash receipts from farming were \$597 million.

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\* See footnote on page 131.

Leading farm commodities in 1961 were: Wheat, \$112 million; milk, \$85 million; and cattle, \$61 million.

WEST VIRGINIA had 42,000 farms in 1962, of which about 29 percent were commercial. Average farm size was 155 acres. The State had a total of 6.5 million farmland acres, or about 39 percent of total land area. Average value of farm land and buildings was \$12,413. Farm marketings in 1962 were \$99 million; \$77 million from livestock, \$22 million from crops. Average gross income per farm was \$3,220, net income per farm was \$898. Total cash receipts from farming were \$103 million.

Leading farm commodities in 1961 were: Cattle, \$23 million; milk, \$23 million; and broilers, \$11 million.

WISCONSIN had 133,000 farms in 1962, of which about 81 percent were commercial. Average farm size was about 165 acres. The State had a total of 22 million farmland acres, or about 60 percent of total land area. Average value of farm land and buildings was \$24,092. Farm marketings in 1962 were \$1.1 billion; \$1 billion from livestock, \$140 million from crops. Average gross income per farm was \$9,800, net income per farm was \$3,252. Total cash receipts from farming were \$1.2 billion.

Leading farm commodities in 1961 were: Milk, \$610 million; cattle, \$159 million; and hogs, \$107 million.

WYOMING had 10,000 farms in 1962, of which about 83 percent were commercial. Average farm size was 3,600 acres. The State had a total of 36 million farmland acres, or about 58 percent of total land area. Average value of farm land and buildings was \$95,755. Farm marketings in 1962 were \$157 million; \$131 million from livestock, \$26 million from crops. Average gross income per farm was \$17,833, net income per farm was \$4,461. Total cash receipts from farming were \$168 million.

Leading farm commodities in 1961 were: Cattle, \$86 million; sheep, \$14 million; and wool, \$9 million.

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\* See footnote on page 131.



## Appendix 2

### GLOSSARY \*

Acetate. A salt of acetic acid; cellulose acetate or one of its products (as a textile, fiber, yarn or fabric).

Acreage Allotment.

National -- The number of acres of a basic price-supported commodity. At average yields, this will produce the amount normally needed for domestic use and export, as determined in the price-support legislation affecting the commodity.

Farm -- An individual farm's share of the national acreage allotment of a basic commodity, determined in accordance with a formula prescribed by law.

Adequate-size farm. A farm with enough resources and productivity to generate enough income to cover expenses for: (1) An acceptable level of family living, (2) current operating expenses, (3) interest on debt payments, and (4) to allow for capital growth to keep in step with technological growth.

Ad valorem. Rate based on value. Example: a tariff of 10 percent ad valorem would be 10 cents on every \$1.00 of value of the imported commodity.

Agricultural attaches. Agricultural specialists of U.S. Department of Agriculture's Foreign Agriculture Service, attached to 60 U.S. diplomatic posts to represent the interests of American agriculture abroad.

Agricultural ladder. An expression used to describe the classic path to farm ownership; viz, working as a hired hand, acquiring equity in livestock and equipment, renting a farm, buying a farm, and, finally, owning an unencumbered farm.

Agricultural market development. All activities, in the U.S. and abroad, to maintain and expand the flow of U.S. farm products to consumers. Much development work is conducted cooperatively by U.S. Department of Agriculture and private trade groups.

Animal unit. A measure of livestock numbers by which kinds, classes, sizes, and ages are converted to an approximate common standard, equivalent to a mature cow (approximately 1,000 lbs. live weight).

Arid. A term applied to regions or climates that lack sufficient moisture for crop production without irrigation. The limits of precipitation vary considerably, according to temperature conditions.

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\*A more comprehensive listing is: A Dictionary of Agricultural and Allied Terminology, published by the Michigan State University Press, East Lansing, Michigan, 1962.  
905 pp.      \$15.00.



Attainable yield. Yields that would be expected, in the time period considered, from actual application of presently known technology.  
See Yield, economic maximum.

Base-period price. The average price for an item in a specified period -- such as 1910-14, 1935-39, 1957-59.

Adjusted base-period price. In parity calculations, the average price received by farmers in the most recent 10 years, divided by the index (1910-14=100) of average prices received by farmers for all farm products in the same 10 years.

Basic crops. Crops which are most important in the agricultural economy due to acreage, value, or climate; such as corn, wheat, cotton.

Breeding unit index. The total number of female breeding animals, weighted by the production per head, in a base period, expressed as an index.

Casein. A protein found only in milk. Used for making cheese, paint, glue, and plastics.

Cash-grain farm. A farm on which corn, sorghums, small grains, soybeans, or field beans and peas account for at least 50 percent of the value of farm products sold.

Cellulose. The chief component of plant cell walls. Used to make cloth and paper, among many other products.

Census of Agriculture. A census taken by the Bureau of Census and the U.S. Department of Agriculture every 5 years--of number of farms; land in farms; crop acreage and production; livestock numbers and production; farm spending, farm facilities and equipment, farm tenure, value of farm products sold; farm size; type of farm, etc. Data are given for States and counties.

Climate. The sum total of all atmospheric or meteorological influences--principally temperature, moisture, wind, pressure, and evaporation--which combine to characterize a region and give it individuality by influencing the nature of its land forms, soils, vegetation, and land use.

Commercial farm. Farm with gross sales of at least \$2,500. Farms with gross sales of \$50 to \$2,499 also are classified as commercial if the operator is under 65 and did not work off the farm more than 100 days during the year, and the gross sales were more than all nonfarm income of the operator and his family.

Common Market (European Economic Community). The economic merger of France, West Germany, Italy, Belgium, Netherlands, and Luxembourg to form a unified area in which commerce will be carried on freely--much as it is among the States of the U.S. The EEC countries will ultimately have no tariffs between themselves, but a common policy with respect to imports from "outside" countries.

Complementary imports. Agricultural items not produced in appreciable commercial volume in the U.S. Examples: Bananas, coffee, rubber, cocoa, tea, spices, and cordage fiber. See Supplementary imports.



Conservation, soil. The preservation of soil against deterioration and loss, by using it within its capabilities and applying conservation practices needed for its protection and improvement. More specifically, soil conservation is using land within the limits of economic practicability, while safeguarding it against impoverishment or depletion by erosion, deposition, exhaustion of plant nutrients (through leaching, excessive cropping or overgrazing), accumulation of toxic salts, burning, water-logging (inadequate drainage), improper cultivation or any type of improper use, or failure to protect the land from soil loss or impairment of productiveness. See Land Capability, Soils.

Consumer Price Index. General measure of retail prices (goods and services) purchased by urban consumers. Includes prices of food, clothing, housing, and transportation.

Contour farming. Conducting field operations--such as plowing, planting, cultivating, and harvesting--on the contour, or at right angles to the natural slope.

Cooperative. A self-help organization which farmers own and use to handle the off-the-farm part of their business--buying farm supplies, marketing their products, furnishing electric and telephone service, and providing business services--at cost. Essential features are democratic control, limited return on capital, and operation at cost, with distribution of financial benefits to individuals in proportion to their use of association's services.

Copra. Coconut meat dried in the sun.

Corn-hog ratio. Number of bushels of corn that are equal (in value) to 100 pounds of live hogs; i.e., the price of hogs divided by the price of corn. Can be calculated in terms of U.S. average prices received by farmers; prices received by farmers in North Central States; or Chicago prices. A favorable (high) ratio is usually followed by an increase in hog production; an unfavorable (low) ratio, by a decrease.

Corn steepwater. Byproduct of corn wet milling. Used to grow microorganisms for the production of antibiotics.

Corporation farm. A farm that is legally incorporated. This may include family farms as well as larger-than-family farms.

County agent. A professional worker--jointly employed by the county, State land-grant college, and the U.S. Department of Agriculture--to bring agricultural and homemaking information to local people and help them meet farm, home, and community problems. Also called extension agents, farm & home advisors, agricultural, home demonstration, and 4-H or youth agents. See Extension Service.

Cover crop. A close-growing crop, grown primarily to protect and improve soil between periods of regular crops, or between trees and vines in orchards and vineyards.

Credit, supervised. A technique pioneered by the USDA and its predecessor agencies. Adequate amounts of low interest credit are combined with intensive supervision provided by local representatives of the agency to help small farmers and their families upgrade their farming and homemaking. In recent years, a number of private lenders have picked up the idea and are providing similar services to borrowers.



Custom work. Specific farm operations performed under contract between the farmer and the contractor. The contractor furnishes labor, equipment, and materials to complete the operation. Custom harvesting of grain, spraying and picking of fruit, and sheep shearing are examples.

Dextran. A synthetic blood plasma extender made from grain by fermentation. Used to alleviate shock and other emergency conditions.

Dialdehyde starch. A chemical derivative of starch developed from cereal grains. Used to improve wet strength of paper products and tanning leather, among other uses.

Disk. A harrow composed of circular plates arranged at an angle with the line of pull. Used to prepare soil for seeding. Also, disk plow; a plow composed of large circular plates. See harrow.

Dry farming. (1) farming in semiarid or arid regions without irrigation.  
(2) A system of fallow and stubble mulch, designed to absorb and retain the limited precipitation that occurs.

Enzymes. Substances produced by living cells that can bring about or speed up chemical reactions.

Erosion. The detachment and movement of the solid material of the land surface--by wind, moving water, ice, landslides, and creep.

Export subsidy. Government assistance to exporters to enable them to compete in foreign markets. This assistance--on commodities such as wheat, rice, feed grains, and cotton--represents the difference between domestic price and "world price."

Extension Service. A cooperative educational agency, whose county agents and State extension specialists serve as the field arm of the U.S. Department of Agriculture, State colleges, and experiment stations. There are State agricultural extension services in each State, and a Federal Extension Service in the U.S. Department of Agriculture. Together they make up the Cooperative Extension Service. See County Agent.

Factory farm. A farm organization in which the operations on a product are separated in different places and are performed at the same time.

Fallow. Crop land (either tilled or untilled) left idle during the growing season. Tillage is usually practiced to control weeds and encourage the storage of moisture in the soil.

Family farm. A farm business in which the operating family does most of the work and most of the managing--and takes some risks.

Farm. For the 1959 Census of Agriculture, the definition of a farm was based on a combination of the "acres in the place" and the "value of farm products sold." "Place" included all land on which agricultural operations were conducted, under the control of one person or partnership.

Places of 10 or more acres were counted as farms if estimated sales of agricultural products were at least \$50. Places of less than 10 acres were counted as farms if sales of agricultural products for the year were at least \$250. See also Adequate-size farm; Commercial farm; Corporation farm; Factory farm; Family farm; Marginal farm; Subsistence farm.



Farm income. See Gross farm income; Net farm income.

Farmer. One who derives most of his income from farming.

Farming, contract. Producing under an agreement to deliver specified goods and services at a later time.

Federal Land Bank Associations. (formerly National Farm Loan Associations). Local farmer-owned organizations, over 700 in number, through which farmers obtain long-term (up to 40 years) loans.

Feed grain. Any of several grains most commonly used for livestock or poultry feed, such as corn, grain sorghum, oats, barley, and rye.

Fertility, soil. The presence in a soil of the necessary elements, in sufficient amounts, in proper balance and available for the growth of specified plants, when other such factors as light, temperature, and the physical condition of the soil are favorable.

Fertilizer. Any material used to supply one or more of the plant nutrients.

Food, farm-produced. Food products originating on U.S. farms. These include processed products made mainly from farm-produced ingredients, as well as eggs, fresh fruits and vegetables, and other products sold to consumers without processing. Nonfarm foods are those not originating on farms, such as fish.

Food grain. Grain most commonly used for human food; chiefly wheat and rice.

Forward pricing. A system whereby support prices for agricultural products are announced before the planting or breeding season, so that production can be adjusted.

4-H clubs. Organized groups of young people (ages 10-19), through which the Cooperative Extension agents of the U.S. Department of Agriculture and State colleges carry on educational work in farming and homemaking projects, career development, citizenship, leadership, and other youth development activities. The 4-H's stand for Head, Hand, Heart, and Health. See Extension Service.

Fungicide. Any substance used to kill fungi, which are forms of plant life that lack chlorophyll and are unable to make their own food.

Futures contract. An agreement between two people, one who sells and agrees to deliver, and one who buys and agrees to receive, a certain kind and quantity of product to be delivered during a specified delivery month at a specified price.

Great Plains. A dry and semiarid region, spanning the United States from Canada to Mexico. It consists of parts of the Dakotas, Montana, Nebraska, Wyoming, Kansas, Colorado, Oklahoma, Texas, and New Mexico, and lies between the Rockies and approximately the 98th meridian.

Gross farm income. The total gross income realized by farm operators from farming. It includes cash receipts from the sale of farm products, Government payments, value of food and fuel produced and consumed on farms where grown, and rental value of farm dwellings. See Net farm income.

Harrow. A cultivating implement set with spikes, springs, or disks and used to pulverize and smooth soil. See Disk.

Herbicide. Any substance used to kill plants.

Hog-corn price ratio. See Corn-hog ratio.



Hybrid. The offspring of the union between genetically unlike parents, e.g., between male of one variety or specie with the female of another.

Index of prices. See Prices-paid index and Prices-received index.

Integration. The combination (under the management of one firm) of two or more production processes, capable of being operated as separate businesses.

International commodity agreement. An agreement among a number of countries pertaining to international trade of a particular commodity. It usually concerns quantity, maximum and minimum prices, stocks, and production controls. Existing agreements include the International Wheat Agreement and the International Sugar Agreement.

International trade barriers. Obstacles raised by countries against imports. Examples: Tariffs, embargos, quotas, sanitary restrictions.

Land capability. The suitability of land for use without damage. Land capability, as ordinarily used in the U.S., is an expression of the effect of physical land conditions, including climate, on the total suitability for agricultural use without damage. Arable soils are grouped according to their potential and limitations for sustained production of the common cultivated crops. Nonarable soils are grouped according to their potentialities and limitations for the production of permanent vegetation and according to their risks of soil damage if mismanaged.

Land grant college. State colleges and universities, started from Federal Government grants of land to each State, to encourage further practical education in agriculture, homemaking, and the mechanic arts.

Land use planning. The development of plans for the uses of land that will, over a long period, best serve the general welfare, together with the formulation of ways and means to achieve such uses.

Legume. A member of the legume or pulse family. One of the most important and widely distributed plant families. Includes many valuable food and forage species, such as the peas, beans, peanuts, clovers, alfalfas, sweetclovers, lespedezas, vetches, and kudzu. Practically all legumes are nitrogen-fixing plants, and many of the herbaceous species are used as cover and green-manure crops.

Lime. The term lime is commonly used in agriculture to include a great variety of materials, usually composed of the oxide, hydroxide, or carbonate of calcium, or of calcium and magnesium. The most commonly used forms of agricultural lime are ground limestone, hydrated lime, burnt lime, marl, and oyster shells.

Linters. The short fibers remaining on cottonseed after ginning. Too short for usual textile use, they are used for batting and mattress stuffing, and as a source of cellulose.

Malthusian theory of population. Thomas R. Malthus asserted that man could increase his subsistence only arithmetically, whereas population tended to increase geometrically. Thus, population always tended toward the limit set by subsistence, and was contained within that limit by the operation of positive and preventive checks--such as famine, pestilence, and premature mortality.

Man-year equivalent. A full year of work by an able-bodied man.



Marginal farm. A farm that, on the average, produces barely enough income to maintain the farm and support an average operator at a low level of living.

Market basket of farm foods. The average quantities of domestic farm-produced foods, purchased per family in 1952, for consumption at home, by urban wage-earner and clerical-worker families.

Marketing margin. The difference between the retail price of a product and the farm value. The marketing margin, also known as the farm-retail spread, is the charges made by marketing firms for assembling, storing, processing, transporting, and distributing the product. It may also be the difference between the retail cost of a group of products and their total farm value.

Marketing order (Federal). A means (authorized by, and based on, enabling legislation) to permit agricultural producers to affect the supply, demand and/or price for a particular crop or commodity. The basic purpose is to improve returns to producers through orderly marketing. An order may establish and maintain minimum quality standards, and provide for an orderly flow of products to market to avoid unreasonable fluctuations in supplies and prices.

Mohair. Goat hair, used in making certain kinds of fabric.

Mutual Security Act. Legislation providing for sale of U.S. farm products for foreign currencies. Administered by Agency for International Development. See Public Law 480.

National Forest. A forest area, owned by the Federal Government and used for watershed protection, timber production, recreation, and in some areas, limited grazing of livestock. National Forests are administered by the Forest Service.

National Grassland. An area of land, mainly grass and shrub cover, owned by the Federal Government and administered by the Secretary of Agriculture as part of the National Forest System; for promotion of grassland agriculture, watersheds, grazing, wildlife and recreation.

National Park. An area of unusual scenic or historic interest, owned by the Federal Government, and set aside primarily for recreational use. The scenery, the historic objects, and the wildlife are conserved in such a manner that they will be unimpaired for the enjoyment of future generations. Logging, grazing by livestock, and hunting are prohibited. Regulated fishing is permitted in certain areas.

National Wool Act. Legislation that provides for price support of shorn wool, at an incentive level, to encourage a minimum production of 300 million pounds annually. This is about half of annual domestic use.

Naval stores. Products, such as turpentine and resin obtained from the distillation of crude pine gum.

Nematocide. Any substance used to kill nematodes. These are very small worms, abundant in many soils; important because many of them attack and destroy plant roots.

Net income. The income farm operators realize as a return for labor, investment, and management, after production expenses have been paid.

Total net income. Net income adjusted for the net inventory change in the value of farm crops and livestock. This income figure is comparable with the national income figures of the Department of Commerce.



Nitrogen. A chemical element essential to life. Animals get it from protein foods, plants get it from soil, and some bacteria get it directly from air. One of the primary plant nutrients.

Northern region. See Regions.

Oil crops. The three main oil crops are flaxseed, soybeans, and cottonseed. Sunflower, safflower, and corn are also used for making oil.

One-man baling. Use of field pickup hay balers, with self-tying attachments and bale ejectors, that allow one man to harvest hay crops.

Palm kernel. Fruit of the oil palm tree, used to make palm oil for soap, candles, greases.

Parity. A standard used to measure the degree to which farm product prices or farm incomes are in line with what Congress has defined as a fair goal or objective.

Parity prices are the dollars-and-cents prices that will give farm commodities the same purchasing power they had in a selected base period when prices received and paid by farmers were considered to be in good balance.

Farm prices at or above parity means that prices received by farmers are in a more favorable relationship to the prices farmers must pay for the goods and services they buy, than when prices are below parity.

Parity ratio. The ratio of the index of prices received by farmers to the parity index. Or, the average percentage of parity farmers receive for their products.

Performance testing. Measuring of ability rather than appearance. For example, judging dairy cattle on production rather than type-scores.

Pesticide. A substance used to kill a pest; a nonspecific term that includes insecticides, fungicides, herbicides, and nematocides.

Phosphate. An important element in fertilizer. Derived from phosphoric acid, it occurs in bones and certain rocks. A term commonly used to indicate a fertilizer supplying phosphorous.

Plasticizer. An additive to plastics to make them soft and flexible under various conditions of use and temperature.

Potash. Potassium carbonate, an essential nutrient for plant growth and a major element in chemical fertilizers. A term commonly used to indicate a fertilizer supplying potassium.

Prices-paid index. The index of prices farmers pay for goods and services (including interest, taxes, and farm wage rates) used for producing farm products and in farm family living (1910-14=100). Also referred to as the Parity Index.

Prices-received index. An index of average prices received by farmers, for 55 of the most important products sold by farmers (1910-14=100).

Production credit associations. Associations, owned by their farmer-borrowers, that provide operating loans for periods up to 1 year and capital loans for periods up to 7 years, from funds obtained from investors in the money markets. There are 486 PCA's.

Production expenses. Total cash outlays for production (excluding capital expenditures), plus "noncash" outlays, such as depreciation.



Public Law 480. A law enacted to expand agricultural trade between the U.S. and friendly nations, and to make most efficient use of agricultural abundances to further U.S. foreign policy. Through four titles, it provides:

- Title I -- Sale of U.S. farm products for foreign currencies used for the mutual benefit of the U.S. and the purchasing country.
- Title II -- Use of abundant agricultural products (held by the Commodity Credit Corporation) for famine and similar relief abroad. Administered by AID (Agency for International Development).
- Title III -- two programs: One provides for distribution of abundant foods to needy persons in the U.S. and abroad. The other provides for barter of CCC commodities for strategic and other materials, goods, and equipment the U.S. needs.
- Title IV -- For long-term supply and dollar credit sales of U.S. agricultural products. See Mutual Security Act.

Pulpwood. Wood used in the manufacture of paper and synthetic fibers.

Quota crop. A crop for which marketing quotas are provided, under the Agricultural Adjustment Act of 1938, as amended. These crops are tobacco, wheat, rice, cotton, and peanuts.

Ranch. An establishment, including land and facilities, used for the production of livestock. Accepted western usage generally refers to the headquarters facilities, pastures, and other land as the ranch, as distinguished from range. Loosely, a large western farm; as, a fruit ranch.

Rangeland. Land that produces primarily native forage suitable for grazing by livestock. Also, forest land, producing forage. Usually, relatively extensive areas of land suitable for grazing, but not suitable for cultivation -- especially in arid, semiarid, or forested regions.

Regions.

Northern

Northeast--Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont

East North Central--Illinois, Indiana, Michigan, Ohio, Wisconsin

West North Central--Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota

Southern

South Atlantic--Florida, Georgia, North Carolina, South Carolina, Virginia, West Virginia

East South Central--Alabama, Kentucky, Mississippi, Tennessee

West South Central--Arkansas, Louisiana, Oklahoma, Texas

Western.

Mountain--Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming

Pacific--Alaska, California, Hawaii, Oregon, Washington



Resin. A crude, hard gum, naturally exuded from trees, usually pine trees. Resin is processed into rosin and turpentine. Rosin and turpentine are also manufactured from pine wood. Rosin is used in varnish and soap and as a dryer for oil.

Resources. Available means for production. Land, labor, and capital are the basic means of production on farms.

Rosin. See Resin.

Rotation, crop. The growing of different crops, in recurring succession, on the same land.

Roughage. Feed, such as hay and silage, with high fiber content and low total digestible nutrients.

Section 32. A section of Public Law 320 (approved August 24, 1935) which authorizes use of customs receipts funds to encourage increased consumption of agricultural commodities by means of purchase, export, and diversion programs. The Food Stamp Plan is also carried out with Section 32 funds.

Sharecropper. Tenant who shares crops, livestock, or livestock products with the landlord, and who usually works under close supervision of the landlord.

Silage. A crop that has been preserved in a moist, succulent condition by partial fermentation in a tight container (silo). The chief silage crops are corn, sorghum and various legumes and grasses.

Soil. A dynamic natural body on the surface of the earth in which plants grow, composed of mineral and organic materials and living forms. In the United States about 70,000 kinds of soil are recognized in the nationwide system of classification. Each has a unique set of characteristics and a unique potential for use.

A soil series is a group of soils alike in all those properties that influence the behavior of the soil in its natural environment. They are given proper names from place names within the areas where they occur. Thus Norfolk, Miami, and Houston are names of well-known soil series.

A soil type is a group within a series according to the texture of the surface soil, such as Miami silt loam. Many series have only one type.

A phase is a subdivision of a soil type on the basis of some factor of importance to its use under culture. Thus Miami silt loam, undulating, and Miami silt loam, sloping, are phases within Miami silt. Other phases are those indicating stoniness, depth to rock, and so forth.

Soil Bank. A program authorized by Congress in 1956, establishing an Acreage Reserve, until 1958, provided that growers be compensated each year to reduce production of certain crops. The Conservation Reserve provided for rental payments to farmers who retired cropland for 3 to 10 years. Legal authority to take additional land into the Conservation Reserve ended in 1960, but contracts remain in effect.

Soil conservation district. An organization, created under State Law, for developing and carrying out a program of soil and water conservation within its geographic boundaries. In most States, a soil conservation district is a legal subdivision of the State Government, autonomously controlled, with public powers.



Sorghum. A cereal grass, used mainly for feed grain or silage. Often grown in corn areas.

Southern region. See Regions.

Soybeans. A legume crop, native to the Orient, used mainly in the U.S. for high protein feed and oil.

Starch. A complex carbohydrate found in most plant seeds, bulbs, and tubers.

Stilbestrol. An organic compound that, when consumed by animals, acts as an estrogen or female hormone, and promotes growth. Used for fattening meat animals.

Stripcropping. Growing crops in a systematic arrangement of strips or bands, to serve as vegetative barriers to wind and water erosion. See Contour farming.

Stubble mulch. A protective cover provided by leaving plant residues of any previous crop as a mulch on the soil surface when preparing for the following crop.

Subsistence farm. A low-income farm, where the emphasis is on production for use of the operator and his family.

Supplementary imports. Imports that supplement output of U.S. agriculture. Examples: Cattle, meat, fruit, vegetables, and tobacco. See Complementary imports.

Synthetics. Artificially produced products, that may be similar to natural products.

Tall oil. Byproduct from the manufacture of chemical wood pulp. Used in making soaps and for various industrial products.

Technology. The application of new techniques and innovations.

Tobacco (types)

Air-cured--Cured under natural atmospheric conditions.

Artificial heat is sometimes used to control excess humidity during the drying period.

Fire-cured--Cured under artificial atmospheric conditions, by the use of open fires, from which the smoke and fumes of burning wood are partly absorbed by the tobacco.

Flue-Cured--Cured under artificial atmospheric conditions, by regulating heat and ventilation, without allowing smoke or fumes from the fuel to come in contact with the tobacco.

Trace element. A chemical substance that occurs in minute amounts in plants. Some are beneficial to plant and animal growth, some may exert detrimental effects, and some have no known effects.

Tung nut. A tree nut, grown for industrial drying oil.

Unit cost. The total production cost of a single item. The total cost (fixed plus variable) divided by the number of items produced.

Upland cotton. A type of cotton, native to the United States, Mexico, and Central America. Includes all cotton grown in continental United States except Sea Island and American-Egyptian cotton. Staple length of upland cotton ranges from 3/4 inch to 1-3/32 inches.

Utilization research. Study of how a commodity can be used, in contrast with production research, which is study of how a commodity can be produced more efficiently.

Vinyl stearate. A plasticizer made from animal fats and acetylene. This material is chemically bound into a plastic, to keep it soft and flexible.

Watershed. (1) The total land area, regardless of size, above a given point on a waterway, that contributes runoff water to the flow at that point. (2) A major drainage-area subdivision of a drainage basin. On the basis of this concept, the United States is generally divided into some 18 major drainage areas, 160 principal river drainage basins, containing some 12,700 smaller watersheds.

Waterway. A natural course for the flow of water.

Western region. See Regions.

Wheel-track planting. The practice of planting seed directly in front of the rear tractor tires so that the tires will press the soil around the seed.

Yield, economic maximum. Yield based on full efficient economic application of presently known technology. Does not take into account limitations on management, materials, equipment, capital and experience.  
See Attainable yield.



# *Appendix 3*

## U. S. DEPARTMENT OF AGRICULTURE ORGANIZATION AND FUNCTION

Every day all citizens of the United States, and many other people in the world, benefit from the services of the United States Department of Agriculture. The Department is involved directly or indirectly with food on our tables, fabric in our clothes, and material in our houses and furnishings.

### FARM LEADERSHIP IN FARM PROGRAMS

The Department encourages local farm leadership in its programs. State and local committees, established by Federal law, administer conservation cost-sharing programs, price supports, marketing orders, and other activities.

Local advisory committees, for agricultural education, farm credit, and other programs, take a vigorous part in advising and administering these programs. The President appoints a National Agricultural Advisory Commission. The Secretary appoints a Rural Areas Development Advisory Committee, a National Co-operative Advisory Committee, a Committee on Agricultural Science, many farm commodity advisory committees, and other groups that help determine policy. The Department also provides help to farmers through 2,900 locally organized soil conservation districts with which it cooperates.

This democratic principle of informing the public and encouraging citizen participation gives people a chance to genuinely take part in the programs and activities that affect them.

### HOW IT STARTED

In 1862 President Abraham Lincoln approved an Act of Congress creating the Department of Agriculture, "the general design and duties of which shall be to acquire and diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word. . ."

### HOW IT WORKS

In Washington, D. C., the Secretary of Agriculture and his staff direct the programs assigned by Congress. In every part of the United States, and in many foreign countries, employees administer programs and carry out responsibilities authorized by Congress.

As new laws added new programs, in response to the people's needs, the Department grew. It is now organized into seven service and administrative groups. An Assistant Secretary, or other official, heads each group to interpret and execute its policies.

### Federal-States Relations

Agricultural Research Service -- Conducts basic and applied research on crop and livestock production, including control of agricultural pests and diseases; on agricultural engineering, soil and water conservation, and soil-plant relationships; on human nutrition, family economics, and consumer use of foods, clothing, and housing; and on extending the uses of farm products. Also administers Federal programs to control or eradicate crop and livestock pests, including inspection and quarantine activities to prevent entry of foreign pests, and to safeguard the Nation's meat supply through Federal inspection of meat and meat products in interstate commerce.

Cooperative State Experiment Station Service -- Administers Federal funds for research at State Agricultural Experiment Stations; coordinates agricultural research among States, and between States and the Department.

Federal Extension Service -- Has primary responsibility for USDA educational programs and coordination of all educational activities of the Department.

### Agricultural Economics

Economic Research Service -- Conducts research in agricultural economics and marketing (domestic and foreign); analyzes factors affecting agricultural production, supplies, prices and income; reports outlook for major commodities; evaluates market potentials; analyzes farm production costs, financing, potentials; analyzes farm production costs, financing, potentials of low income areas; studies U. S. trade in agricultural products, foreign markets, role of agriculture in economic development of other nations.

Statistical Reporting Service -- Prepares estimates of production, supply, prices of agricultural commodities, farm labor, livestock numbers.

### Rural Development and Conservation

Office of Rural Areas Development -- Provides leadership and initiative in policies and plans for carrying out the rural areas development program of the Department.



Farmers Home Administration -- Makes loans for the following: To buy farms and improve farming operations; continue normal farm operations disrupted by disasters; build or improve rural housing; water systems and soil and water conservation measures; small watershed projects. All loans are accompanied by supervision, i.e., planning and management assistance, and are made only to applicants who cannot obtain credit from other sources.

Rural Electrification Administration -- Makes loans to local business organizations to bring electric power and modern telephone service to rural areas; works with them to stimulate new enterprises in their service areas.

Farmers Cooperative Service -- Responsible for research and advisory and educational service to help farmers strengthen their cooperative business enterprises; works closely with land-grant colleges, cooperatives, and other agencies in furthering farmer cooperatives; provides annual statistics on numbers and memberships of farmer cooperatives and their dollar volumes of business; publishes results of its research and news for farmer cooperatives.

Forest Service -- Responsible for managing the national forests, cooperates with the States and private forestland owners in carrying out better forestry practices; does forest research and related rangeland research.

Soil Conservation Service -- Administers the Federal part of the National Cooperative Soil Survey; provides other technical help to farmers and ranchers through local soil conservation districts; administers the Department's upstream flood-prevention and watershed-protection program; administers the Department's Great Plains Conservation Program and snow survey work.

#### Marketing and Stabilization

Agricultural Marketing Service -- Responsible for marketing research and marketing services, including market news, standardization, grading, inspection and classing of farm products; freight rate services, regulatory marketing programs, fruit, vegetable and milk marketing agreements and orders; export and diversion programs. Also, administers programs to improve marketing, and increase consumption of farm products, such as direct distribution of foods, work with food trades, the national school lunch program, the special milk program, and the pilot food stamp program.

Commodity Exchange Authority -- Supervises futures trading on commodity exchanges to maintain fair trading practices and competitive pricing, and to prevent price manipulation and other violations of the Commodity Exchange Act.

Agricultural Stabilization and Conservation Service -- Responsible for production and adjustment activities, including acreage allotments and farm marketing quotas; the Agricultural Conservation Program; the Soil Bank; sugar production and marketing stabilization; price support; foreign supply and purchase, commodity disposal, storage facilities, and other assigned programs of CCC; administering the International Wheat Agreement; procurement, handling payment, and related services on assigned purchase and export programs; drought emergency feed programs; and certain defense food activities.

Federal Crop Insurance Corporation -- Insures farmers against loss of crop investments, due to risks beyond their control.

#### Foreign Agriculture

Foreign Agricultural Service -- Promotes U. S. farm product exports; protects domestic agricultural markets from unfair foreign competition; serves as a basic source of information to American agriculture on world crops, policies, and markets.

#### Office of the General Counsel

Provides legal advice and service, as an aid to administration and enforcement of programs, including legal opinions; contracts, titles, conveyances, patents and claims; rule-making and adjudication, litigation. Also serves as counsel for Commodity Credit Corporation and Federal Crop Insurance Corporation.

#### Department Administrative Offices

Budget and Finance, Office of -- Directs, coordinates, and supervises the budget and fiscal affairs of the Department, including budget administration, accounting, financial reporting, internal audit, fiscal management, and legislative review and reporting.



Hearing Examiners, Office of -- Holds hearings and performs related duties concerning procedures, regulations, and other service activities.

Information, Office of -- Develops, plans, and executes the Department's information policies and programs, including press service, radio and television, special reports; clearance, printing, and distribution of publications; motion picture service, art and graphics, photography and exhibits.

Management Appraisals and Systems Development, Office of -- Provides leadership for improving management. Directs, coordinates, and provides technical guidance for management appraisals, operations research, systems engineering and automatic data processing. Directs centralized service system, using ADP equipment, in payrolling, personnel record-keeping, and related budget and accounting.

National Agricultural Library -- Collects and organizes the world's agricultural and related science literature and disseminates this knowledge.

Personnel, Office of -- Plans and directs the Department's personnel program, including recruitment, placement, promotions, safety, classification, training, pay, retirement and personnel legislation. Also handles employee services and performs other related operations.

Plant and Operations, Office of -- Handles real estate and space management, procurement, and service operations, including communications, reproduction, and supplies.

# Appendix 4

## BIBLIOGRAPHY AND ADDITIONAL MATERIAL

Publications marked with an asterisk (\*) are available (at the price given) from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Single copies of all others listed are available free while the supply lasts. Requests should be addressed to the Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

For a complete list of free and for sale publications, ask for a copy of List No. 11, List of Available Publications of the U. S. Department of Agriculture.

For a listing of Periodic Reports of Agricultural Economics, write to Division of Information, MOS, Agricultural Economics, U. S. Department of Agriculture, Washington 25, D. C.

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